Catasauqua Area School District
Planned Course of Study

Course Title: AP Computer Science Principles

Grade Level(s): 9 - 12

Text: Code.org curriculum - CollegeBoard approved for AP Computer Science Principles

Course Description

Code.org's Computer Science Principles (CSP) curriculum is a full-year, rigorous, entry-level course that introduces high school students to the foundations of modern computing. The course covers a broad range of foundational topics such as programming, algorithms, the Internet, big data, digital privacy and security, and the societal impacts of computing. All teacher and student materials are provided for free online and can be accessed at code.org/csp. Meets all requirements set forth for the CollegeBoard AP Computer Science Principles course and test. Option exists to take or not take the AP exam. Grading for the AP exam: 30% Create Performance Task, 70% End-of-Course Multiple-Choice Exam.

Essential Questions & Competencies

Big Ideas from College Board for CS Principles course

<u>Big Idea 1: Creative Development</u>

You'll learn how important collaboration is in developing programs and how to use an iterative process in your work.

<u>Big Idea 2: Data</u>

You'll explore how computers handle data and how data can be used to produce new information and solve problems.

<u>Big Idea 3: Algorithms and Programming</u>

You'll learn how to use algorithms and abstractions to create programs that solve problems or to express your own creativity.

<u>Big Idea 4: Computer Systems and Networks</u>

You'll explore how computer systems and networks work and how using multiple computers to divide tasks can speed up processes.

<u>Big Idea 5: Impact of Computing</u>

You'll examine the effects computing has had on societies, economies, and cultures and consider the legal and ethical responsibilities of programmers.

Big Questions:

How do computers represent information?

How does information get from one computer to another?

What challenges are involved when developing systems to represent or transmit information?

What problems was the internet designed to solve and how does it solve these problems?

How has the design of the internet allowed it to grow or evolve?

Who or what is "in charge" of the internet?

How should we resolve dilemmas caused by the structure and continuing growth of the internet?

How are images and other complex information represented in a computer?
How can we reduce the size of digital information and what tradeoffs are involved?
Why are there so many different formats for representing the same kind of information?
Why do we need algorithms?
How is designing an algorithm to solve a problem different from other kinds of problem solving?
How do you design a solution for a problem that is programmable?
What does it mean to be a “creative” programmer?
How do programmers collaborate?
What opportunities do large data sets provide for solving problems and creating knowledge?
How is cybersecurity impacting the ever-increasing number of internet users?
How does cryptography work?
How do you program apps to respond to user “events”?
How do you write programs to make decisions?
How do programs keep track of information?
How creative is programming?
How do people develop, test, and debug programs?
How do you write programs to store and process large amounts of information?
How are real world phenomena simulated on a computer?
What are “data structures” in a program and when do you need them?
How are algorithms evaluated for “speed”?

Catasauqua Area School District
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Course Syllabus

Course Content	Tentative Timeframe (Block Schedule)	State Standards
Unit 1: Digital Information	1.5 weeks	**CSTA AP:** 3A-AP-21 **CSTA CS:** 3A-CS-02 **CSTA DA:** 2-DA-07 3A-DA-09 3A-DA-10 **CSTA DAT-1:** DAT-1.A DAT-1.A.2 DAT-1.A.3 DAT-1.A.4 DAT-1.A.5 DAT-1.A.6 DAT-1.A.7 DAT-1.A.8 DAT-1.A.9 DAT-1.A.10 DAT-1.B DAT-1.B.1 DAT-1.B.2 DAT-1.B.3 DAT-1.C DAT-1.C.1 DAT-1.C.2 DAT-1.C.3 DAT-1.C.4 DAT-1.C.5 DAT-1.D DAT-1.D.5 DAT-1.D.6 DAT-1.D.7 DAT-1.D.8 **CSTA IC:** 2-IC-20 3A-IC-24 3B-IC-27 3B-IC-28 **CSTA IOC-1:** IOC-1.F IOC-1.F.1 IOC-1.F.2 IOC-1.F.3

		IOC-1.F.4 IOC-1.F.5 IOC-1.F.6 IOC-1.F.7
Unit 2: The Internet	1 week	**CSTA IC:** 3A-IC-24 3A-IC-28 3A-IC-30 3B-IC-26 3B-IC-28 **CSTA IOC-1:** IOC-1.C IOC-1.C.4 IOC-1.C.5 IOC-1.F IOC-1.F.10 **CSTA IOC-2:** IOC-2.B IOC-2.B.6 **CSTA NI:** 2-NI-04 3A-NI-04 3B-NI-03 **CSTA CSN-1:** CSN-1.A CSN-1.A.1 CSN-1.A.2 CSN-1.A.3 CSN-1.A.4 CSN-1.A.5 CSN-1.A.6 CSN-1.A.7 CSN-1.A.8 CSN-1.B CSN-1.B.1 CSN-1.B.2 CSN-1.B.3 CSN-1.B.4 CSN-1.B.5 CSN-1.B.6 CSN-1.B.7 CSN-1.C CSN-1.C.1 CSN-1.C.2 CSN-1.C.3 CSN-1.C.4 CSN-1.D CSN-1.D.1 CSN-1.D.2 CSN-1.D.3 CSN-1.E CSN-1.E.1 CSN-1.E.2 CSN-1.E.3 CSN-1.E.4 CSN-1.E.5 CSN-1.E.6

		CSN-1.E.7
Unit 3: Intro to App Design	1.5 weeks	**CSTA AAP-2:** AAP-2.B AAP-2.B.2 AAP-2.B.6 AAP-2.B.7 **CSTA AAP-3:** AAP-3.E AAP-3.E.2 **CSTA AP:** 2-AP-17 3A-AP-13 3A-AP-16 3A-AP-19 3A-AP-21 3A-AP-22 3A-AP-23 **CSTA CRD-1:** CRD-1.A CRD-1.A.3 CRD-1.A.4 CRD-1.A.5 CRD-1.A.6 CRD-1.B CRD-1.B.1 CRD-1.B.2 **CSTA CRD-2:** CRD-2.A CRD-2.A.2 CRD-2.B CRD-2.B.1 CRD-2.B.2 CRD-2.B.3 CRD-2.B.4 CRD-2.B.5 CRD-2.C CRD-2.C.1 CRD-2.C.2 CRD-2.C.3 CRD-2.C.4 CRD-2.C.5 CRD-2.C.6 CRD-2.D CRD-2.D.1 CRD-2.D.2 CRD-2.E CRD-2.E.1 CRD-2.E.2 CRD-2.E.3 CRD-2.E.4 CRD-2.F CRD-2.F.1 CRD-2.F.2 CRD-2.F.3 CRD-2.F.4 CRD-2.F.5 CRD-2.F.6

		CRD-2.F.7 CRD-2.G CRD-2.G.1 CRD-2.G.2 CRD-2.G.3 CRD-2.G.4 CRD-2.G.5 CRD-2.I CRD-2.I.5 CRD-2.J CRD-2.J.1 CRD-2.J.3 **CSTA CS:** 3A-CS-03
Unit 4: Variables, Conditionals, and Functions	1.5 weeks	**CSTA AP:** 2-AP-10 2-AP-11 2-AP-12 2-AP-19 3A-AP-15 3A-AP-16 3A-AP-17 3B-AP-14 3B-AP-21 3B-AP-23 **CSTA AAP-1:** AAP-1.A AAP-1.A.1 AAP-1.B AAP-1.B.1 AAP-1.B.2 AAP-1.B.3 AAP-1.C AAP-1.C.4 **CSTA AAP-2:** AAP-2.B AAP-2.B.3 AAP-2.B.4 AAP-2.B.5 AAP-2.C AAP-2.C.1 AAP-2.C.2 AAP-2.C.3 AAP-2.C.4 AAP-2.E AAP-2.E.1 AAP-2.E.2 AAP-2.F AAP-2.F.1 AAP-2.F.2 AAP-2.F.3 AAP-2.F.4 AAP-2.F.5 AAP-2.H AAP-2.H.1 AAP-2.H.2 AAP-2.H.3

		AAP-2.I AAP-2.I.1 AAP-2.L AAP-2.L.3 AAP-2.L.4 **CSTA AAP-3:** AAP-3.A AAP-3.A.1 AAP-3.A.2 AAP-3.A.4 AAP-3.A.6 AAP-3.A.9 AAP-3.E AAP-3.E.1 **CSTA CRD-2:** CRD-2.I CRD-2.I.1 CRD-2.I.2 CRD-2.I.3 CRD-2.I.4 CRD-2.J CRD-2.J.2 **CSTA DAT-1:** DAT-1.A DAT-1.A.1 DAT-1.B DAT-1.B.2
Unit 5: Lists, Loops, and Traversals	2 weeks	**CSTA AP:** 3A-AP-14 3A-AP-15 3A-AP-16 3A-AP-22 3A-AP-23 3B-AP-10 3B-AP-23 **CSTA AAP-1:** AAP-1.A AAP-1.A.3 AAP-1.A.4 AAP-1.C AAP-1.C.1 AAP-1.C.2 AAP-1.C.3 AAP-1.D AAP-1.D.1 AAP-1.D.2 AAP-1.D.3 AAP-1.D.4 AAP-1.D.5 AAP-1.D.6 AAP-1.D.7 AAP-1.D.8 **CSTA AAP-2:** AAP-2.D AAP-2.D.2 AAP-2.K AAP-2.K.1

		AAP-2.K.2 AAP-2.K.3 AAP-2.K.4 AAP-2.K.5 AAP-2.L AAP-2.L.1 AAP-2.L.2 AAP-2.L.5 AAP-2.N AAP-2.N.1 AAP-2.N.2 AAP-2.O AAP-2.O.1 AAP-2.O.2 AAP-2.O.3 AAP-2.O.4 **CSTA AAP-3:** AAP-3.F AAP-3.F.1 AAP-3.F.2 AAP-3.F.3 AAP-3.F.4 AAP-3.F.5 AAP-3.F.6 AAP-3.F.7 AAP-3.F.8 **CSTA CRD-2:** CRD-2.B CRD-2.B.2 CRD-2.I CRD-2.I.3 CRD-2.I.4 **CSTA DA:** 3A-DA-12 **CSTA DAT-2:** DAT-2.D DAT-2.D.6
Unit 6: Algorithms	1 week	**CSTA AP:** 3B-AP-10 3B-AP-11 **CSTA AAP-2:** AAP-2.A AAP-2.A.1 AAP-2.A.2 AAP-2.A.3 AAP-2.A.4 AAP-2.B AAP-2.B.1 AAP-2.G AAP-2.G.1 AAP-2.J AAP-2.J.1 AAP-2.L AAP-2.L.1 AAP-2.L.2 AAP-2.L.5 AAP-2.O

		AAP-2.O.5 AAP-2.P AAP-2.P.1 AAP-2.P.2 AAP-2.P.3 **CSTA AAP-4:** AAP-4.A AAP-4.A.1 AAP-4.A.2 AAP-4.A.3 AAP-4.A.4 AAP-4.A.5 AAP-4.A.6 AAP-4.A.7 AAP-4.A.8 AAP-4.A.9 AAP-4.B AAP-4.B.1 AAP-4.B.2 AAP-4.B.3 **CSTA CSN-2:** CSN-2.A CSN-2.A.1 CSN-2.A.2 CSN-2.A.3 CSN-2.A.4 CSN-2.A.5 CSN-2.A.6 CSN-2.A.7 CSN-2.B. CSN-2.B.1 CSN-2.B.2 CSN-2.B.3 CSN-2.B.4 CSN-2.B.5
Unit 7: Parameters, Return, and Libraries	1.5 weeks	**CSTA AP:** 2-AP-14 2-AP-17 3A-AP-18 3B-AP-14 3B-AP-16 3B-AP-23 **CSTA AAP-2:** AAP-2.C AAP-2.C.2 AAP-2.C.3 AAP-2.M AAP-2.M.1 AAP-2.M.2 AAP-2.M.3 AAP-2.O AAP-2.O.1 **CSTA AAP-3:** AAP-3.A AAP-3.A.1 AAP-3.A.3 AAP-3.A.5

		AAP-3.A.7 AAP-3.A.8 AAP-3.B AAP-3.B.1 AAP-3.B.2 AAP-3.B.3 AAP-3.B.4 AAP-3.B.5 AAP-3.B.6 AAP-3.B.7 AAP-3.C AAP-3.C.1 AAP-3.C.2 AAP-3.D AAP-3.D.1 AAP-3.D.2 AAP-3.D.3 AAP-3.D.4 AAP-3.D.5 **CSTA CRD-2:** CRD-2.H CRD-2.H.1 CRD-2.H.2 CRD-2.F CRD-2.F.7 CRD-2.H CRD-2.H.1 CRD-2.H.2
Unit 8: Create PT Prep	1.5 weeks (Plus 12 dedicated hours)	**CSTA AP:** 3A-AP-16 3A-AP-18 3A-AP-19 3A-AP-21 3A-AP-23 3B-AP-14
Unit 9: Data	1 week	**CSTA AP:** 3B-AP-08 **CSTA DA:** 3A-DA-10 3A-DA-11 3B-DA-05 3B-DA-06 **CSTA DAT-2:** DAT-2.A DAT-2.A.1 DAT-2.A.2 DAT-2.A.3 DAT-2.A.4 DAT-2.B DAT-2.B.1 DAT-2.B.2 DAT-2.B.3 DAT-2.B.4 DAT-2.B.5 DAT-2.C DAT-2.C.1 DAT-2.C.2

		DAT-2.C.3 DAT-2.C.4 DAT-2.C.5 DAT-2.C.6 DAT-2.C.7 DAT-2.C.8 DAT-2.D DAT-2.D.1 DAT-2.D.2 DAT-2.D.3 DAT-2.D.4 DAT-2.D.5 DAT-2.D.6 DAT-2.E DAT-2.E.1 DAT-2.E.2 DAT-2.E.3 DAT-2.E.4 DAT-2.E.5 **CSTA IOC-1:** IOC-1.B IOC-1.B.1 IOC-1.D IOC-1.D.1 IOC-1.D.2 IOC-1.D.3 IOC-1.E IOC-1.E.1 IOC-1.E.2 IOC-1.E.3 IOC-1.E.4 IOC-1.E.5 IOC-1.E.6
Unit 10: Cybersecurity and Global Impacts	1.5 weeks	**CSTA IC:** 2-IC-23 3A-IC-24 3A-IC-27 3A-IC-29 3A-IC-30 3B-IC-25 3B-IC-28 **CSTA CRD-1:** CRD-1.A CRD-1.A.1 CRD-1.A.2 CRD-1.C CRD-1.C.1 **CSTA CRD-2:** CRD-2.A CRD-2.A.1 **CSTA IOC-1:** IOC-1.A IOC-1.A.1 IOC-1.A.2 IOC-1.A.3 IOC-1.A.4 IOC-1.A.5

		IOC-1.B IOC-1.B.1 IOC-1.B.2 IOC-1.B.3 IOC-1.B.4 IOC-1.B.5 IOC-1.B.6 IOC-1.F IOC-1.F.11 IOC-1.F.8 IOC-1.F.9 **CSTA IOC-2:** IOC-2.A IOC-2.A.1 IOC-2.A.10 IOC-2.A.11 IOC-2.A.12 IOC-2.A.13 IOC-2.A.14 IOC-2.A.15 IOC-2.A.2 IOC-2.A.3 IOC-2.A.4 IOC-2.A.5 IOC-2.A.6 IOC-2.A.7 IOC-2.A.8 IOC-2.A.9 IOC-2.B IOC-2.B.1 IOC-2.B.10 IOC-2.B.11 IOC-2.B.2 IOC-2.B.3 IOC-2.B.4 IOC-2.B.7 IOC-2.B.8 IOC-2.B.9 IOC-2.C IOC-2.C.1 IOC-2.C.2 IOC-2.C.3 IOC-2.C.4 IOC-2.C.5 IOC-2.C.6 IOC-2.C.7 **CSTA NI:** 3A-NI-05 3A-NI-06 3A-NI-07 3B-NI-04

Teaching Strategies Utilized

Direct Instruction
Indirect Instruction
Unplugged and Plugged Activities
Pair Programming
Classroom Discussion
Think-Pair-Share
Peer Feedback
Debugging
Journaling

Catasauqua Area School District
Course Title: **Computer Science Principles**
Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 1: Problem Solving and Computing** ● Explore how computers store complex information like numbers, text, images and sound. ● Debate the impacts of digitizing information. ***Lesson 1: Welcome to CSP*** ***Lesson 2: Representing Information*** ***Lesson 3: Circle Square Patterns*** ***Lesson 4: Binary Numbers*** ***Lesson 5: Overflow and Rounding*** ***Lesson 6: Representing Text*** ***Lesson 7: Black and White Images*** ***Lesson 8: Color Images*** ***Lesson 9: Lossless Compression*** ***Lesson 10: Lossy Compression*** ***Lesson 11: Intellectual Property*** ***Lesson 12: Project - Digital Information*** ***Lesson 13: Dilemmas - Parts 1-2***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 3A-AP-21 **CSTA CS:** 3A-CS-02 **CSTA DA:** 2-DA-07 3A-DA-09 3A-DA-10 **CSTA DAT-1:** DAT-1.A DAT-1.A.2 DAT-1.A.3 DAT-1.A.4 DAT-1.A.5 DAT-1.A.6 DAT-1.A.7 DAT-1.A.8 DAT-1.A.9 DAT-1.A.10 DAT-1.B DAT-1.B.1 DAT-1.B.2 DAT-1.B.3 DAT-1.C DAT-1.C.1 DAT-1.C.2 DAT-1.C.3 DAT-1.C.4 DAT-1.C.5 DAT-1.D DAT-1.D.5 DAT-1.D.6 DAT-1.D.7 DAT-1.D.8 **CSTA IC:** 2-IC-20 3A-IC-24 3B-IC-27 3B-IC-28 **CSTA IOC-1:** IOC-1.F IOC-1.F.1 IOC-1.F.2 IOC-1.F.3 IOC-1.F.4 IOC-1.F.5 IOC-1.F.6 IOC-1.F.7

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org
Interdisciplinary Relationships
Career Readiness - Basic computer skills, use and understanding of images, compression, and binary. Learn about intellectual property. Mathematics - Number systems, calculating the correspondence between binary and Arabic number system English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills Productivity and Accountability

Catasauqua Area School District
Course Title: **Computer Science Principles**
Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 2: The Internet** ● Learn about how the internet works. ● Discuss the internet's impacts on politics, culture, and the economy. ***Lesson 1: Welcome to the Internet*** ***Lesson 2: Building a Network*** ***Lesson 3: The Need for Addressing*** ***Lesson 4: Routers and Redundancy*** ***Lesson 5: Packets*** ***Lesson 6: HTTP and DNS*** ***Lesson 7: Project - Internet Dilemmas - Parts 1-2***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA IC:** 3A-IC-24 3A-IC-28 3A-IC-30 3B-IC-26 3B-IC-28 **CSTA IOC-1:** IOC-1.C IOC-1.C.4 IOC-1.C.5 IOC-1.F IOC-1.F.10 **CSTA IOC-2:** IOC-2.B IOC-2.B.6 **CSTA NI:** 2-NI-04 3A-NI-04 3B-NI-03 **CSTA CSN-1:** CSN-1.A CSN-1.A.1 CSN-1.A.2 CSN-1.A.3 CSN-1.A.4 CSN-1.A.5 CSN-1.A.6 CSN-1.A.7 CSN-1.A.8 CSN-1.B CSN-1.B.1 CSN-1.B.2 CSN-1.B.3 CSN-1.B.4 CSN-1.B.5 CSN-1.B.6 CSN-1.B.7 CSN-1.C CSN-1.C.1 CSN-1.C.2 CSN-1.C.3 CSN-1.C.4 CSN-1.D CSN-1.D.1 CSN-1.D.2 CSN-1.D.3 CSN-1.E

				CSN-1.E.1 CSN-1.E.2 CSN-1.E.3 CSN-1.E.4 CSN-1.E.5 CSN-1.E.6 CSN-1.E.7

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org

Interdisciplinary Relationships
Career Readiness - Basic internet knowledge and application is covered and explained Digital Footprint Education - Proper use of the internet, sharing of information **21st Century Student Outcomes:** Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills Productivity and Accountability

Catasauqua Area School District
Course Title: Computer Science Principles
Grade Level: 9 - 12

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 3: Intro to App Design** ● Design their first app while learning both fundamental programming concepts and collaborative software development processes. ***Lesson 1: Intro to Apps*** ***Lesson 2: Introduction to Design Mode*** ***Lesson 3: Project - Designing an App - Parts 1-2*** ***Lesson 4: The Need for Programming languages*** ***Lesson 5: Intro to Programming*** ***Lesson 6: Debugging*** ***Lesson 7: Project - Designing an App - Parts 3-5***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AAP-2:** AAP-2.B AAP-2.B.2 AAP-2.B.6 AAP-2.B.7 **CSTA AAP-3:** AAP-3.E AAP-3.E.2 **CSTA AP:** 2-AP-17 3A-AP-13 3A-AP-16 3A-AP-19 3A-AP-21 3A-AP-22 3A-AP-23 **CSTA CRD-1:** CRD-1.A CRD-1.A.3 CRD-1.A.4 CRD-1.A.5 CRD-1.A.6 CRD-1.B CRD-1.B.1 CRD-1.B.2 **CSTA CRD-2:** CRD-2.A CRD-2.A.2 CRD-2.B CRD-2.B.1 CRD-2.B.2 CRD-2.B.3 CRD-2.B.4 CRD-2.B.5 CRD-2.C CRD-2.C.1 CRD-2.C.2 CRD-2.C.3 CRD-2.C.4 CRD-2.C.5 CRD-2.C.6 CRD-2.D CRD-2.D.1 CRD-2.D.2 CRD-2.E CRD-2.E.1 CRD-2.E.2 CRD-2.E.3 CRD-2.E.4 CRD-2.F

				CRD-2.F.1 CRD-2.F.2 CRD-2.F.3 CRD-2.F.4 CRD-2.F.5 CRD-2.F.6 CRD-2.F.7 CRD-2.G CRD-2.G.1 CRD-2.G.2 CRD-2.G.3 CRD-2.G.4 CRD-2.G.5 CRD-2.I CRD-2.I.5 CRD-2.J CRD-2.J.1 CRD-2.J.3 **CSTA CS:** 3A-CS-03

Resources/Materials

Code.org
Computer with internet
iPad with internet
Notebook/journal
Printed Handouts from Code.org

Interdisciplinary Relationships

Mathematics - Location in coordinate plane, problem solving strategies and practices
Science - Scientific method used for the designing of the app process
English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript
21st Century Student Outcomes:
Creativity and Innovation
Critical Thinking and Problem Solving
Communication and Collaboration
Information Literacy
Media Literacy
ICT Literacy
Flexibility and Adaptability
Initiative and Self-Direction
Social and Cross-Cultural Skills
Productivity and Accountability

Catasauqua Area School District
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Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 4: Variables, Conditionals, and Functions** ● Expand the types of apps you can create by adding the ability to store information, make decisions, and better organize code. ***Lesson 1: Variables Explore*** ***Lesson 2: Variables Investigate*** ***Lesson 3: Variables Practice*** ***Lesson 4: Variables Make*** ***Lesson 5: Conditionals Explore*** ***Lesson 6: Conditionals Investigate*** ***Lesson 7: Conditionals Practice*** ***Lesson 8: Conditionals Make*** ***Lesson 9: Functions Explore/Investigate*** ***Lesson 10: Functions Practice*** ***Lesson 11: Functions Make*** ***Lesson 12: Project - Decision Maker App - Parts 1 - 3***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 2-AP-10 2-AP-11 2-AP-12 2-AP-19 3A-AP-15 3A-AP-16 3A-AP-17 3B-AP-14 3B-AP-21 3B-AP-23 **CSTA AAP-1:** AAP-1.A AAP-1.A.1 AAP-1.B AAP-1.B.1 AAP-1.B.2 AAP-1.B.3 AAP-1.C AAP-1.C.4 **CSTA AAP-2:** AAP-2.B AAP-2.B.3 AAP-2.B.4 AAP-2.B.5 AAP-2.C AAP-2.C.1 AAP-2.C.2 AAP-2.C.3 AAP-2.C.4 AAP-2.E AAP-2.E.1 AAP-2.E.2 AAP-2.F AAP-2.F.1 AAP-2.F.2 AAP-2.F.3 AAP-2.F.4 AAP-2.F.5 AAP-2.H AAP-2.H.1 AAP-2.H.2 AAP-2.H.3 AAP-2.I AAP-2.I.1 AAP-2.L AAP-2.L.3 AAP-2.L.4 **CSTA AAP-3:** AAP-3.A

				AAP-3.A.1 AAP-3.A.2 AAP-3.A.4 AAP-3.A.6 AAP-3.A.9 AAP-3.E AAP-3.E.1 **CSTA CRD-2:** CRD-2.I CRD-2.I.1 CRD-2.I.2 CRD-2.I.3 CRD-2.I.4 CRD-2.J CRD-2.J.2 **CSTA DAT-1:** DAT-1.A DAT-1.A.1 DAT-1.B DAT-1.B.2

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org

Interdisciplinary Relationships
Mathematics - Use of variables, conditional statements, functions Science - Scientific method used for the designing of the app process English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills Productivity and Accountability

Catasauqua Area School District
Course Title: Computer Science Principles
Grade Level: 9 - 12

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 5: Lists, Loops, and Traversals** ● Build apps that use large amounts of information and pull in data from the web to create a wider variety of apps. ***Lesson 1: Lists Explore*** ***Lesson 2: Lists Investigate*** ***Lesson 3: Lists Practice*** ***Lesson 4: Lists Make*** ***Lesson 5: Loops Explore*** ***Lesson 6: Loops Investigate*** ***Lesson 7: Loops Practice*** ***Lesson 8: Loops Make*** ***Lesson 9: Traversals Explore*** ***Lesson 10: Traversals Investigate*** ***Lesson 11: Traversals Practice*** ***Lesson 12: Traversals Make*** ***Lesson 13: Project - Hackathon - Parts 1-3*** ***Lesson 14: Project - Hackathon - Parts 4-5***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 3A-AP-14 3A-AP-15 3A-AP-16 3A-AP-22 3A-AP-23 3B-AP-10 3B-AP-23 **CSTA AAP-1:** AAP-1.A AAP-1.A.3 AAP-1.A.4 AAP-1.C AAP-1.C.1 AAP-1.C.2 AAP-1.C.3 AAP-1.D AAP-1.D.1 AAP-1.D.2 AAP-1.D.3 AAP-1.D.4 AAP-1.D.5 AAP-1.D.6 AAP-1.D.7 AAP-1.D.8 **CSTA AAP-2:** AAP-2.D AAP-2.D.2 AAP-2.K AAP-2.K.1 AAP-2.K.2 AAP-2.K.3 AAP-2.K.4 AAP-2.K.5 AAP-2.L AAP-2.L.1 AAP-2.L.2 AAP-2.L.5 AAP-2.N AAP-2.N.1 AAP-2.N.2 AAP-2.O AAP-2.O.1 AAP-2.O.2 AAP-2.O.3 AAP-2.O.4 **CSTA AAP-3:**

				AAP-3.F AAP-3.F.1 AAP-3.F.2 AAP-3.F.3 AAP-3.F.4 AAP-3.F.5 AAP-3.F.6 AAP-3.F.7 AAP-3.F.8 **CSTA CRD-2:** CRD-2.B CRD-2.B.2 CRD-2.I CRD-2.I.3 CRD-2.I.4 **CSTA DA:** 3A-DA-12 **CSTA DAT-2:** DAT-2.D DAT-2.D.6

Resources/Materials

Code.org
Computer with internet
iPad with internet
Notebook/journal
Printed Handouts from Code.org

Interdisciplinary Relationships

Mathematics - Using large amounts of data with lists, loops, and traversals needs basic number skills to analyze the process taken
English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript
21st Century Student Outcomes:
Creativity and Innovation
Critical Thinking and Problem Solving
Communication and Collaboration
ICT Literacy
Flexibility and Adaptability
Initiative and Self-Direction
Social and Cross-Cultural Skills
Productivity and Accountability

Catasauqua Area School District
Course Title: **Computer Science Principles**
Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 6: Algorithms** ● Design and analyze algorithms to understand how they work and why some are considered better than others. ***Lesson 1: Algorithms Solve Problems*** ***Lesson 2: Algorithm Efficiency*** ***Lesson 3: Unreasonable Time*** ***Lesson 4: The Limits of Algorithms*** ***Lesson 5: Parallel and Distributed Algorithms***	 AW K AP M	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 3B-AP-10 3B-AP-11 **CSTA AAP-2:** AAP-2.A AAP-2.A.1 AAP-2.A.2 AAP-2.A.3 AAP-2.A.4 AAP-2.B AAP-2.B.1 AAP-2.G AAP-2.G.1 AAP-2.J AAP-2.J.1 AAP-2.L AAP-2.L.1 AAP-2.L.2 AAP-2.L.5 AAP-2.O AAP-2.O.5 AAP-2.P AAP-2.P.1 AAP-2.P.2 AAP-2.P.3 **CSTA AAP-4:** AAP-4.A AAP-4.A.1 AAP-4.A.2 AAP-4.A.3 AAP-4.A.4 AAP-4.A.5 AAP-4.A.6 AAP-4.A.7 AAP-4.A.8 AAP-4.A.9 AAP-4.B AAP-4.B.1 AAP-4.B.2 AAP-4.B.3 **CSTA CSN-2:** CSN-2.A CSN-2.A.1 CSN-2.A.2 CSN-2.A.3 CSN-2.A.4

				CSN-2.A.5 CSN-2.A.6 CSN-2.A.7 CSN-2.B. CSN-2.B.1 CSN-2.B.2 CSN-2.B.3 CSN-2.B.4 CSN-2.B.5

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org

Interdisciplinary Relationships
Mathematics - Use of algorithms or rules that must be applied to the program for it to work Science - Scientific method used for the designing of algorithms and improving upon designs English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills Productivity and Accountability

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 7: Parameters, Returns, and Libraries** ● Learn how to design clean and reusable code that you can share with a single classmate or the entire world. ***Lesson 1: Parameters and Return Explore*** ***Lesson 2: Parameters and Return Investigate*** ***Lesson 3: Parameters and Return Practice*** ***Lesson 4: Parameters and Return Make*** ***Lesson 5: Libraries Explore*** ***Lesson 6: Libraries Investigate*** ***Lesson 7: Libraries Practice*** ***Lesson 8: Project - Make a Library - Parts 1-3***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 2-AP-14 2-AP-17 3A-AP-18 3B-AP-14 3B-AP-16 3B-AP-23 **CSTA AAP-2:** AAP-2.C AAP-2.C.2 AAP-2.C.3 AAP-2.M AAP-2.M.1 AAP-2.M.2 AAP-2.M.3 AAP-2.O AAP-2.O.1 **CSTA AAP-3:** AAP-3.A AAP-3.A.1 AAP-3.A.3 AAP-3.A.5 AAP-3.A.7 AAP-3.A.8 AAP-3.B AAP-3.B.1 AAP-3.B.2 AAP-3.B.3 AAP-3.B.4 AAP-3.B.5 AAP-3.B.6 AAP-3.B.7 AAP-3.C AAP-3.C.1 AAP-3.C.2 AAP-3.D AAP-3.D.1 AAP-3.D.2 AAP-3.D.3 AAP-3.D.4 AAP-3.D.5 **CSTA CRD-2:** CRD-2.H CRD-2.H.1 CRD-2.H.2 CRD-2.F CRD-2.F.7 CRD-2.H

				CRD-2.H.1 CRD-2.H.2

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org

Interdisciplinary Relationships
Mathematics - Use of parameters and how they affect the code Science - Scientific method used for the designing of the parameters and libraries English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills Productivity and Accountability

Catasauqua Area School District
Course Title: **Computer Science Principles**
Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 8: Create PT Task** ● Practice and complete the Create Performance Task (PT). ***Lesson 1: Create PT - Review the Task*** ***Lesson 2: Create PT - Make a Plan*** ***Lesson 3: Create PT - Complete the Task (12 total class hours)***	AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 3A-AP-16 3A-AP-18 3A-AP-19 3A-AP-21 3A-AP-23 3B-AP-14

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org

Interdisciplinary Relationships
Mathematics - Problem solving and application of skills learned previously Science - Scientific method used for the designing of the app process English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills

Productivity and Accountability Leadership and Responsibility Global Awareness Financial, Economic, Business and Entrepreneurial Literacy

Catasauqua Area School District
Course Title: **Computer Science Principles**
Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 9: Data** ● Explore and visualize datasets from a wide variety of topics as you hunt for patterns and try to learn more about the world around you. ***Lesson 1: Learning from Data*** ***Lesson 2: Exploring One Column*** ***Lesson 3: Filtering and Cleaning Data*** ***Lesson 4: Exploring Two Columns*** ***Lesson 5: Big, Open, and Crowdsourced Data*** ***Lesson 6: Machine Learning and Bias*** ***Lesson 7: Project - Tell A Data Story - Parts 1-2***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA AP:** 3B-AP-08 **CSTA DA:** 3A-DA-10 3A-DA-11 3B-DA-05 3B-DA-06 **CSTA DAT-2:** DAT-2.A DAT-2.A.1 DAT-2.A.2 DAT-2.A.3 DAT-2.A.4 DAT-2.B DAT-2.B.1 DAT-2.B.2 DAT-2.B.3 DAT-2.B.4 DAT-2.B.5 DAT-2.C DAT-2.C.1 DAT-2.C.2 DAT-2.C.3 DAT-2.C.4 DAT-2.C.5 DAT-2.C.6 DAT-2.C.7 DAT-2.C.8 DAT-2.D DAT-2.D.1 DAT-2.D.2 DAT-2.D.3 DAT-2.D.4 DAT-2.D.5 DAT-2.D.6 DAT-2.E DAT-2.E.1 DAT-2.E.2 DAT-2.E.3 DAT-2.E.4 DAT-2.E.5 **CSTA IOC-1:** IOC-1.B IOC-1.B.1 IOC-1.D IOC-1.D.1 IOC-1.D.2 IOC-1.D.3

				IOC-1.E IOC-1.E.1 IOC-1.E.2 IOC-1.E.3 IOC-1.E.4 IOC-1.E.5 IOC-1.E.6

Resources/Materials
Code.org Computer with internet iPad with internet Notebook/journal Printed Handouts from Code.org

Interdisciplinary Relationships
Mathematics - Analyze and apply large amounts of data, looking for patterns, also while filtering results Science - Scientific method used for the creating and application process of the use of the data English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Flexibility and Adaptability Social and Cross-Cultural Skills Productivity and Accountability Global Awareness

Catasauqua Area School District
Course Title: **Computer Science Principles**
Grade Level: **9 - 12**

Objectives	Level of Ach.	Suggested Learning Activities	Forms of Assessment	PA Stand.
The student will be able to: **Unit 10: Cybersecurity and Global Impacts** ● Research and debate current events at the intersection of data, public policy, law, ethics, and societal impact. ***Lesson 1: Project - Innovation Simulation - Parts 1-2*** ***Lesson 2: Data Policies and Privacy*** ***Lesson 3: The Value of Privacy*** ***Lesson 4: Project - Innovation Simulation - Part 3*** ***Lesson 5: Security Risks - Part 1-2*** ***Lesson 6: Project - Innovation Simulation - Part 4*** ***Lesson 7: Protecting Data - Parts 1-2*** ***Lesson 8: Project - Innovation Simulation - Parts 5-7***	AW K AP M R	Unplugged Activities Plugged Activities Pair Programming Think-Pair-Share Peer Feedback Debugging Journaling	Observation of Work Graded Assignments Homework Assessments	**CSTA IC:** 2-IC-23 3A-IC-24 3A-IC-27 3A-IC-29 3A-IC-30 3B-IC-25 3B-IC-28 **CSTA CRD-1:** CRD-1.A CRD-1.A.1 CRD-1.A.2 CRD-1.C CRD-1.C.1 **CSTA CRD-2:** CRD-2.A CRD-2.A.1 **CSTA IOC-1:** IOC-1.A IOC-1.A.1 IOC-1.A.2 IOC-1.A.3 IOC-1.A.4 IOC-1.A.5 IOC-1.B IOC-1.B.1 IOC-1.B.2 IOC-1.B.3 IOC-1.B.4 IOC-1.B.5 IOC-1.B.6 IOC-1.F IOC-1.F.11 IOC-1.F.8 IOC-1.F.9 **CSTA IOC-2:** IOC-2.A IOC-2.A.1 IOC-2.A.10 IOC-2.A.11 IOC-2.A.12 IOC-2.A.13 IOC-2.A.14 IOC-2.A.15 IOC-2.A.2 IOC-2.A.3 IOC-2.A.4 IOC-2.A.5 IOC-2.A.6

				IOC-2.A.7 IOC-2.A.8 IOC-2.A.9 IOC-2.B IOC-2.B.1 IOC-2.B.10 IOC-2.B.11 IOC-2.B.2 IOC-2.B.3 IOC-2.B.4 IOC-2.B.7 IOC-2.B.8 IOC-2.B.9 IOC-2.C IOC-2.C.1 IOC-2.C.2 IOC-2.C.3 IOC-2.C.4 IOC-2.C.5 IOC-2.C.6 IOC-2.C.7 **CSTA NI:** 3A-NI-05 3A-NI-06 3A-NI-07 3B-NI-04

Resources/Materials
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Interdisciplinary Relationships
Science - Scientific method used for the designing of the innovation simulation English - Literacy skills, grammar skills, spelling, punctuation, proper use of camel case and Javascript **21st Century Student Outcomes:** Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Flexibility and Adaptability Initiative and Self-Direction Social and Cross-Cultural Skills Productivity and Accountability Leadership and Responsibility Global Awareness Financial, Economic, Business and Entrepreneurial Literacy