



## **Mobile CSP**

### ***Course Description***

The Mobile Computer Science Principles course provides an introduction to the basic principles of computer science (CS) from the perspective of mobile computing, including programming in App Inventor, a graphical programming language for Android mobile devices. The lessons and materials used by students incorporate programming while also integrating all other AP CSP big ideas: creativity, abstraction, data and information, algorithms, the internet and global impact. The curriculum engages students and supports the development of problem solving skills honing in on the computational thinking practices as indicated in the AP CSP curriculum framework. Students learn to create socially useful computational artifacts using App Inventor as well as connect computing and learn about abstracting as they develop and analyze their programs. The curriculum also emphasizes communication and collaboration in a project-based approach and classroom environment. This course involves a strong writing component. Students will maintain a portfolio of their work, which will include several performance tasks in the areas of programming and the impact of computing technology.

## Mobile CSP

Pacing Guide		
Unit	Topic	Suggested Timing
Unit 1	Getting Started	approx. 8 weeks
Unit 2	Exploring Computing	approx. 8 weeks
Unit 3	Algorithms and Procedural Abstractions	approx. 7 weeks
Unit 4	Using and Analyzing Data & Information	approx. 12 weeks

## Educational Technology Standards

8.1.12.A.1, 8.1.12.A.2, 8.1.12.A.3, 8.1.12.B.2, 8.1.12.C.1, 8.1.12.D.1, 8.1.12.D.4, 8.1.12.D.5, 8.1.12.E.2, 8.1.12.F.1

### ➤ **Technology Operations and Concepts**

- Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
- Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
- Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.

### ➤ **Creativity and Innovation**

- Apply previous content knowledge by creating and piloting a digital learning game or tutorial.

### ➤ **Communication and Collaboration**

- Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.

### ➤ **Digital Citizenship**

- Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.
- Research and understand the positive and negative impact of one's digital footprint.
- Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs.

### ➤ **Research and Information Literacy**

- Research and evaluate the impact on society of the unethical use of digital tools and present your research to peers.

### ➤ **Critical Thinking, Problem Solving, Decision Making**

- Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.

## Career Ready Practices

*Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.*

### **CRP1. Act as a responsible and contributing citizen and employee**

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

### **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.

### **CRP4. Communicate clearly and effectively and with reason.**

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

### **CRP5. Consider the environmental, social and economic impacts of decisions.**

Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social

## Career Ready Practices

condition, the environment and the profitability of the organization.

### **CRP6. Demonstrate creativity and innovation.**

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

### **CRP7. Employ valid and reliable research strategies.**

Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.

### **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**

Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

### **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.

### **CRP11. Use technology to enhance productivity.**

## Career Ready Practices

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

**CRP12. Work productively in teams while using cultural global competence.**

Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

## Differentiated Instruction

### Strategies to Accommodate Students Based on Individual Needs

<u>Time/General</u>	<u>Processing</u>	<u>Comprehension</u>	<u>Recall</u>
<ul style="list-style-type: none"> <li>• Extra time for assigned tasks</li> <li>• Adjust length of assignment</li> <li>• Timeline with due dates for reports and projects</li> <li>• Communication system between home and school</li> <li>• Provide lecture notes/outline</li> </ul>	<ul style="list-style-type: none"> <li>• Extra Response time</li> <li>• Have students verbalize steps</li> <li>• Repeat, clarify or reword directions</li> <li>• Mini-breaks between tasks</li> <li>• Provide a warning for transitions</li> <li>• Reading partners</li> </ul>	<ul style="list-style-type: none"> <li>• Precise step-by-step directions</li> <li>• Short manageable tasks</li> <li>• Brief and concrete directions</li> <li>• Provide immediate feedback</li> <li>• Small group instruction</li> <li>• Emphasize multi-sensory learning</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher-made checklist</li> <li>• Use visual graphic organizers</li> <li>• Reference resources to promote independence</li> <li>• Visual and verbal reminders</li> <li>• Graphic organizers</li> </ul>
<u>Assistive Technology</u>	<u>Tests/Quizzes/Grading</u>	<u>Behavior/Attention</u>	<u>Organization</u>
<ul style="list-style-type: none"> <li>• Computer/whiteboard</li> <li>• Tape recorder</li> <li>• Spell-checker</li> <li>• Audio-taped books</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Study guides</li> <li>• Shortened tests</li> <li>• Read directions aloud</li> </ul>	<ul style="list-style-type: none"> <li>• Consistent daily structured routine</li> <li>• Simple and clear classroom rules</li> <li>• Frequent feedback</li> </ul>	<ul style="list-style-type: none"> <li>• Individual daily planner</li> <li>• Display a written agenda</li> <li>• Note-taking assistance</li> <li>• Color code materials</li> </ul>

## Enrichment

### **Strategies Used to Accommodate Based on Students Individual Needs:**

- Adaption of Material and Requirements
- Evaluate Vocabulary
- Additional Projects
- Independent Student Options
- Projects completed individual or with Partners
- Self Selection of Research
- Tiered/Multilevel Activities
- Learning Centers
- Individual Response Board
- Independent Book Studies
- Open-ended activities
- Community/Subject expert mentorships

## Assessments

### Suggested Formative/Summative Classroom Assessments

- Portfolios
- Reading and Homework assignments
- Labs
- Projects
- Oral and Video presentations
- Quizzes and exams
- Self-check and Live coding exercises

## Interdisciplinary Connections

### English Language Arts

- Journal writing
- Close reading of industry-related content
- Create a brochure for a specific industry
- Keep a running word wall of industry vocabulary

### Social Studies

- Research the history of a given industry/profession
- Research prominent historical individuals in a given industry/profession
- Use historical references to solve problems

### World Language

- Translate industry-content
- Create a translated index of industry vocabulary
- Generate a translated list of words and phrases related to information technology

### Math

- Compare and contrast use of equations and variables in algebra and programming.
- Program graphics and use the properties of geometric shapes
- Compare the computer graphic coordinate system with the Cartesian coordinate plane in math
- Compare probability and the use of random numbers in computer programming.
- Track and track various data, such as industry's impact on the GDP, career opportunities or among of individuals currently occupying careers

### Fine & Performing Arts

- Create a poster recruiting young people to focus their studies on a career in Information Technology

### Science

- Research the environmental impact of a given career or industry
- Research latest developments in Information technology
- Investigate applicable-careers in STEM fields

## [New Jersey Student Learning Standards](#)

### **8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming**

#### **Technology and Society**

- 8.2.12.B.3: Analyze ethical and unethical practices around intellectual property rights as influenced by human wants and/or needs.

#### **Design**

- 8.2.12.C.1: Explain how open source technologies follow the design process.

#### **Computational Thinking: Programming**

- 8.2.12.E.1: Demonstrate an understanding of the problem-solving capacity of computers in our world.
- 8.2.12.E.2: Analyze the relationships between internal and external computer components.
- 8.2.12.E.3: Use a programming language to solve problems or accomplish a task.
- 8.2.12.E.4: Use appropriate terms in conversation.

## [New Jersey Student Learning Standards](#)

### **9.3– Career and Technical Education**

#### **Career Cluster: Information Technology (IT)**

- 9.3.12.IT.11: Demonstrate knowledge of the hardware components associated with information systems.
- 9.3.12.IT-SUP.9: Employ technical writing and documentation skills in support of an information system.

#### **Pathway: Programming & Software Development (IT-PRG)**

- 9.3.12.IT-PRG.4: Demonstrate the effective use of software development tools to develop software applications.
- 9.3.12.IT-PRG.5: Apply an appropriate software development process to design a software application.
- 9.3.12.IT-PRG.6: Program a computer application using the appropriate programming language.
- 9.3.12.IT-PRG.7: Demonstrate software testing procedures to ensure quality products.

## **Common Career Technical Core (CCTC)** **Career Cluster Information Technology**

IT.11 – Demonstrate knowledge of the hardware components associated with information systems.

- IT.11.1 - None available at this time.

IT-SUP.9 - Employ technical writing and documentation skills in support of an information system.

- IT-SUP.9.3 - Design technical documentation.

IT-PRG.4 - Demonstrate the effective use of software development tools to develop software applications.

- IT-PRG.4.1 - Employ tools in developing software applications.
- IT-PRG.4.3 - Apply language-specific programming tools/techniques.

IT-PRG.5 - Apply an appropriate software development process to design a software application.

- IT-PRG.5.1 - Describe software development processes and methodology.

IT-PRG.6 - Program a computer application using the appropriate programming language.

- IT-PRG.6.1 - Explain programming language concepts.
- IT-PRG.6.2 - Summarize program development methodology.
- IT-PRG.6.3 - Demonstrate proficiency in developing an application using an appropriate programming language.
- IT-PRG.6.4 - Explain basic software systems implementation.
- IT-PRG.6.6 - Resolve problems with integration.

IT-PRG.7 - Demonstrate software testing procedures to ensure quality products.

- IT-PRG.7.1 - Develop a software test plan.

## Common Core State Standards (CCSS)

### CCSS - English-Language Arts

#### Key Ideas and Details:

- CCSS.ELA-LITERACY.RL.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

#### Integration of Knowledge and Ideas:

- CCSS.ELA-LITERACY.W.11-12.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

#### Production and Distribution of Writing:

- CCSS.ELA-LITERACY.W.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

#### Research to Build and Present Knowledge:

- CCSS.ELA-LITERACY.W.11-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

#### Range of Writing:

- CCSS.ELA-LITERACY.W.11-12.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences

## Common Core State Standards (CCSS)

### CCSS - Mathematics

#### Reason quantitatively and use units to solve problems:

- CCSS.MATH.CONTENT.HSN-Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.

#### Create equations that describe numbers or relationships:

- CCSS.MATH.CONTENT.HSA-CED.A.1 Create equations and inequalities in one variable and use them to solve problems.

#### Analyze functions using different representations:

- CCSS.MATH.CONTENT.HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph.

#### Apply geometric concepts in modeling situations:

- CCSS.MATH.CONTENT.HSG-MG.A.1 Use geometric shapes, their measures, and their properties to describe objects

#### Calculate expected values and use them to solve problems:

- CCSS.MATH.CONTENT.HSS-MD.A.1 Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space;
- CCSS.MATH.CONTENT.HSS-MD.A.2 Calculate the expected value of a random variable;

## **Practice Standards - Mathematics**

- 1. Make sense of problems and persevere in solving them.
- 2. Reason abstractly and quantitatively.
- 3. Construct viable arguments and critique the reasoning of others.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

<p><b>Course:</b> Mobile CSP  <b>Unit:</b> I – Getting Started  <b>Grade Level:</b> 9-12</p>	<p>Unit Overview:</p> <p>This unit focuses on (1) App Inventor's drawing and painting features, (2) getting to know the App Inventor development environment and mobile computing, (3) simulation and modeling, which falls under the big idea of abstraction and related topics from the CS Principles curriculum. The use of project-based learning as a pedagogical tool is introduced. It sets the stage for the rest of the course, emphasizing the collaborative and creative nature of computing. The use of pair programming as a pedagogical tool is introduced. The use of growth mindset as a pedagogical tool is introduced. Students work collaboratively with a partner and create their own mobile app.</p>
<p><b>New Jersey Student Learning Standards (NJSLS):</b> 8.2.12.B.3, 8.2.12.C.1, 8.2.12.E.1, 8.2.12.E.2, 8.2.12.E.3, 8.2.12.E.4            9.3.12.IT.11, 9.3.12.IT-SUP.9.3, 9.3.12.IT-PRG.4.1, 9.3.12.IT-PRG.4.3, 9.3.12.IT-PRG.5.1, 9.3.12.IT-PRG.6.1, 9.3.12.IT-PRG.6.3,            9.3.12.IT-PRG.6.4, 9.3.12.IT-PRG.6.6, 9.3.12.IT-PRG.7.1</p>	
<p><b>Common Career Technical Core (CCTC):</b> IT.11, IT-SUP.9.3, IT-PRG.4.1, IT-PRG.4.3, IT-PRG.5.1, IT-PRG.6.1, IT-PRG.6.3, IT-PRG.6.4, IT-PRG.6.6, IT-PRG.7.1</p>	
<p><b>Common Core State Standards (CCSS):</b> RL.11-12.1; W.11-12.1; W.11-12.4; W.11-12.10; HSN-Q.A.2;</p>	

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>Learn about the course structure and content.</p> <p><b>NJSLS:</b>            8.1.12.D.5            8.2.12.C.1            9.3.12.IT.11.1</p> <p><b>CCTC:</b>            IT.11.1</p>	<ul style="list-style-type: none"> <li>• What is the Mobile CS Principles course?</li> <li>• What is graphical blocks-based programming?</li> <li>• Why is it important to study the impact of computing technology?</li> </ul>	<ul style="list-style-type: none"> <li>• Explain what is the Mobile CS Principles course?</li> <li>• Explain what it means to be open source.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion and video</li> <li>• Setup devices</li> <li>• Angry Bird Maze</li> <li>• Browse the online textbook Blown to Bits</li> </ul>	<p>Mobile CSP Unit 1.1  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=19">https://ram8647.appspot.com/mobileCSP/unit?unit=19</a></p> <p>Mobile CSP Unit 1.2  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=69">https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=69</a></p> <p>Mobile CSP Unit 1.5</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
				Blown to Bits textbook <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=70">https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=70</a>
<p>Create a Google sites portfolio that they will use during the course to post their work.</p> <p><b>NJSLS:</b>            8.1.12.A.1            8.1.12.A.3            8.2.12.B.3            8.2.12.E.1            9.3.12.IT.11.1            9.3.12.IT-PRG.5.1</p> <p><b>CCTC:</b>            IT.11.1            IT-PRG.5.1</p>	<ul style="list-style-type: none"> <li>• How are digital artifacts created and shared globally?</li> <li>• What is cloud computing?</li> <li>• What is the App Inventor Forum?</li> </ul>	<ul style="list-style-type: none"> <li>• Google email account created.</li> <li>• Personalized Google website created.</li> <li>• Explain how to find non-copyrighted material on the internet.</li> </ul>	<ul style="list-style-type: none"> <li>• Create a google email account.</li> <li>• Create a google website for the course.</li> <li>• Create a simple app to test the setup. Test App creation and manipulation of the user interface</li> <li>• Join the App Inventor 2 Forum for App Inventor support.</li> </ul>	<p>Mobile CSP Unit 1.3  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=49">https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=49</a></p> <p>App Inventor Setup Unit 1.4  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=50">https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=50</a></p> <p>Joining the Forum Unit 1.6  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=58">https://ram8647.appspot.com/mobileCSP/unit?unit=19&amp;lesson=58</a></p> <p>Google Sites  <a href="https://sites.google.com/">https://sites.google.com/</a></p> <p>App Inventor 2  <a href="http://ai2.appinventor.mit.edu/">http://ai2.appinventor.mit.edu/</a></p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>Describe what a computer program is.</p> <p><b>NJSLS:</b>            8.2.12.E.1            8.2.12.E.3            8.2.12.E.4            9.3.12.IT.11.1            9.3.12.IT-PRG.4.1            9.3.12.IT-PRG.4.3            9.3.12.IT-PRG.5.1            9.3.12.IT-PRG.6.1            9.3.12.IT-PRG.6.3            9.3.12.IT-PRG.6.4            9.3.12.IT-PRG.6.6</p> <p><b>CCTC:</b>            IT.11.1            IT-PRG.4.1            IT-PRG.4.3            IT-PRG.5.1            IT-PRG.6.1            IT-PRG.6.3            IT-PRG.6.4            IT-PRG.6.6</p> <p><b>CCSS:</b></p>	<ul style="list-style-type: none"> <li>• How does one use App Inventor and event-driven programming to build a mobile app?</li> <li>• Why would you use an if/else block in a program?</li> <li>• How do apps use location awareness?</li> </ul>	<ul style="list-style-type: none"> <li>• Navigate the App Inventor online programming platform.</li> <li>• Use a horizontal arrangement.</li> <li>• Name components in a standard format.</li> <li>• Identify components of event-driven programming.</li> <li>• Explain the concept of an if/else construct.</li> <li>• Use App Inventor's Orientation Sensor and Location Sensor Components.</li> </ul>	<ul style="list-style-type: none"> <li>• I Have a Dream Tutorial</li> <li>• I Have a Dream Part I</li> <li>• I Have a Dream Projects</li> <li>• Where is North Compass App</li> <li>• Reflection on Event Driven programming</li> <li>• Reflection on conditional logic with if/else block.</li> </ul>	<p>Mobile CSP Unit 2.2  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=45">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=45</a></p> <p>Mobile CSP Unit 2.3  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=56">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=56</a></p> <p>Mobile CSP Unit 2.5  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=47">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=47</a></p> <p>Mobile CSP Unit 2.8  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=103">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=103</a></p> <p>Mobile CSP Unit 2.9  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=103">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=103</a></p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>W.11-12.4 W.11-12.10</p> <p>Identify the major functional components of a computer and what they do.</p> <p><b>NJSLS:</b> 8.2.12.E.1 8.2.12.E.2 9.3.12.IT.11.1</p> <p><b>CCTC:</b> IT.11.1</p> <p><b>CCSS:</b> W.11-12.4 W.11-12.10</p>	<ul style="list-style-type: none"> <li>• What is a computer?</li> <li>• What are the various hardware and software abstractions that make up a modern digital computer?</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the relationship between hardware and software.</li> <li>• Describe the concept of abstraction.</li> </ul>	<ul style="list-style-type: none"> <li>• Computer exploration to show students parts of a computer</li> <li>• Videos</li> <li>• Matching activity – term and it’s definition</li> <li>• Interactive exercises</li> <li>• Reflections</li> </ul>	<p>Mobile CSP Unit 2.4 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=46">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=46</a></p> <p>Mobile CSP Unit 2.6 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=61">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=61</a></p>
<p>Explain how everything is composed of bits, including images.</p> <p><b>NJSLS:</b> 8.2.12.E.1 8.2.12.E.4 9.3.12.IT.PRG.5.1</p> <p><b>CCTC:</b></p>	<ul style="list-style-type: none"> <li>• How are digital and technological worlds expanding rapidly?</li> <li>• What is the binary number system that underlies all digital representation?</li> <li>• What are logic gates and truth tables used</li> </ul>	<ul style="list-style-type: none"> <li>• Identify real world examples of bits.</li> <li>• Explain how a computer program must be translated from a high level language into binary code in order to run on a computer.</li> <li>• Count to 20 in the</li> </ul>	<ul style="list-style-type: none"> <li>• Read Blown to Bits (BB) Chapter 1</li> <li>• Analyze positive and negative implications of the digital explosion.</li> <li>• Answer BB Chapter 1 questions in a jigsaw</li> <li>• Base Conversion worksheet.</li> </ul>	<p>Mobile CSP Unit 2.7 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=62">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=62</a></p> <p>Blown to Bits Chapter 1 <a href="http://www.bitsbook.com/wp-content/uploads/2008/12/B2B_3.pdf#page=19">http://www.bitsbook.com/wp-content/uploads/2008/12/B2B_3.pdf#page=19</a></p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
IT.PRG.5.1  <b>CCSS:</b> W.11-12.1; W.11-12.4; W.11-12.10; RL.11-12.1; HSN-Q.A.2	for?	binary system. <ul style="list-style-type: none"> <li>• Convert numbers to and from binary, octal, hexadecimal and decimal,</li> <li>• Write the truth table for AND / OR</li> </ul>	<ul style="list-style-type: none"> <li>• Khan Academy Base Conversion exercises</li> <li>• Binary Conversion Game</li> </ul>	Mobile CSP Unit 2.8 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=63">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=63</a>  Mobile CSP Unit 2.10 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=117">https://ram8647.appspot.com/mobileCSP/unit?unit=1&amp;lesson=117</a>
Program an app using a canvas.  <b>NJSLS:</b> 8.2.12.E.3 8.2.12.E.4 9.3.12.IT.11.1 9.3.12.IT-SUP.9.3 9.3.12.IT-PRG.4.1 9.3.12.IT-PRG.4.3 9.3.12.IT-PRG.5.1 9.3.12.IT-PRG.6.1 9.3.12.IT-PRG.6.3 9.3.12.IT-PRG.6.4 9.3.12.IT-PRG.6.6 9.3.12.IT-PRG.7.1	<ul style="list-style-type: none"> <li>• What are the event handlers that can be used on a canvas?</li> <li>• How does a programmer debug a program?</li> <li>• How does a programmer test a program?</li> <li>• Explain why a variable is an example of an abstraction?</li> </ul>	<ul style="list-style-type: none"> <li>• Explain what an App Inventor program is.</li> <li>• Describe event driven programming.</li> <li>• Apply mathematical and logical concepts to programming.</li> <li>• Use App Inventor's camera component.</li> <li>• Explain valid and invalid variable names</li> <li>• Initialize global variables</li> <li>• Get and Set global variables</li> </ul>	<ul style="list-style-type: none"> <li>• Reproduce the Paint Pot app.</li> <li>• Reflection questions</li> <li>• Presentations of student apps</li> <li>• Write a test plan</li> <li>• Paint Pot Projects</li> <li>• Paint Pot 2 app</li> <li>• Paint Pot 2 projects</li> </ul>	Mobile CSP Unit 3.2 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=32">https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=32</a>  Mobile CSP Unit 3.3 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=33">https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=33</a>  Mobile CSP Unit 3.6 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=35">https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=35</a>  Mobile CSP Unit 3.7 <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=35">https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=35</a>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p><b>CCTC:</b>            IT.11.1            IT-SUP.9.3            IT-PRG.4.1            IT-PRG.4.3            IT-PRG.5.1            IT-PRG.6.1            IT-PRG.6.3            IT-PRG.6.4            IT-PRG.6.6            IT-PRG.7.1</p> <p><b>CCSS:</b>            W.11-12.4;            W.11-12.10</p>				<p><a href="http://com/mobileCSP/unit?unit=22&amp;lesson=36">com/mobileCSP/unit?unit=22&amp;lesson=36</a></p>
<p>Understand that all digital data including images are composed of bits.</p> <p><b>NJSLS:</b>            8.2.12.E.1;            8.2.12.E.4</p> <p><b>CCSS:</b>            W.11-12.4;            W.11-12.10</p>	<ul style="list-style-type: none"> <li>• How can bits have different meaning in different contexts?</li> <li>• Explain why are models and simulations abstractions? How is a digital image a model?</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and contrast lossy and lossless encoding.</li> <li>• Express images as numbers and numbers as images using run length encoding technique.</li> </ul>	<ul style="list-style-type: none"> <li>• CS Unplugged Video and worksheet</li> <li>• Read Blown to Bits Chapter 3</li> <li>• Silent reading</li> <li>• Small group discussion</li> <li>• Answer Blown to Bits Chapter 3 questions in a jigsaw</li> <li>• Encode and decode messages in ASCII binary code</li> </ul>	<p>Mobile CSP Unit 3.4  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=34">https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=34</a></p> <p>Mobile CSP Unit 3.5  <a href="https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=41">https://ram8647.appspot.com/mobileCSP/unit?unit=22&amp;lesson=41</a></p> <p>Blown to Bits Chapter 3  <a href="http://www.bitsbook.com/wp-">http://www.bitsbook.com/wp-</a></p>

<b>Student Learning Objectives (SLOs)</b>	<b>Essential Questions</b>	<b>Skills &amp; Indicators</b>	<b>Sample Activities</b>	<b>Resources</b>
				<a href="content/uploads/2008/12/chapter3.pdf">content/uploads/2008/12/chapter3.pdf</a>

## Unit 1 Vocabulary

mobile computing  
 algorithm  
 program  
 control structures  
 emulator  
 interface  
 binary  
 abstraction  
 event-driven programming  
 special purpose computers  
 general purpose computers  
 Pixel  
 Parity  
 encoding  
 image compression

### **Blown to Bits Chapter 3 Vocabulary**

algorithm  
 analog  
 ASCII  
 cloud computing  
 cryptography  
 digital  
 digital signal processing  
 download  
 lossless compression  
 lossy compression  
 megabyte  
 megapixel  
 modeling  
 OCR  
 pixel  
 raster  
 render  
 spam  
 steganography  
 upload

## Suggested Unit Projects

*Choose At Least One*

**Create: Programming Performance Task #1**

<https://ram8647.appspot.com/mobileCSP/assessment?name=57>

**Submit an app to the Verizon Innovative App Challenge**

<http://appchallenge.tsaweb.org/>

**Write a story with multiple endings to demonstrate if statements. Interactive Fiction**

<https://twinery.org/>

<http://www.inklestudios.com/inklewriter/>

## Suggested Structured Learning Experiences

**TEALS Student Field Trip to Microsoft**

<https://www.tealsk12.org/events/>

**InfoAge Science History Museum**

<https://www.infoage.org>