

**EL DORADO UNION HIGH SCHOOL DISTRICT
EDUCATIONAL SERVICES
Course of Study Information Page**

COURSE TITLE Exploring Computer Science (ECS)																		
DISTRICT COURSE NUMBER #0455		4-DIGIT STATE COURSE CODE (COMPLETED BY SILT) 4634																
Rationale:	<p>Information and Communication Technologies (ICT) have expanded the need for employees who can understand, manage, and support all rapidly emerging, evolving, and converging computer, software, networking, telecommunications, Internet, programming, and information systems. Essential skills for careers in the ICT sector include understanding systems that support the management and flow of data, the ability to work well and communicate clearly with people, and the ability to manage projects efficiently. The ICT sector meets national criteria for high demand, high wages, and high skills and provides students with excellent opportunities for interesting work and good pay.</p> <p>The goal of Exploring Computer Science is to develop in students the computational practices of algorithm development, problem solving and programming within the context of problems that are relevant to the lives of today's students. Students will become members of a "computing community of practice" in the classroom where they will be introduced to the behavior, language, and skills of computer scientists.</p>																	
Course Description that will be in the Course Directory:	<p>Exploring Computer Science is a hands-on introduction to computer architecture, programming, and using the computer as a creative tool. The class is taught in the computer lab and is project-based, rather than textbook-based. The class is divided into six basic units. Units consists of: a survey of computer architecture and human/computer interaction, algorithmic problem-solving, web site development, program design and development using Scratch, data analysis, and robotics. Each unit uses a series of projects of increasing complexity to introduce, refine, and integrate programming and development concepts, culminating with a "capstone" project as a unit final.</p>																	
How Does this Course align with or meet State and District content standards?	<p>This course is aligned with the Information and Communications Technology Industry sector of the Career Technical Education model curriculum standards set by the California State Board of Education in January 2013. This course has been approved as "a-g" college preparatory electives by the University of California Office of the President.</p>																	
NCLB Core Subjects:	<p><i>Select up to two that apply:</i></p> <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Arts</td> <td><input type="checkbox"/> Civics and Government</td> <td><input checked="" type="checkbox"/> Not Core Subject</td> </tr> <tr> <td><input type="checkbox"/> Economics</td> <td><input type="checkbox"/> History</td> <td></td> </tr> <tr> <td><input type="checkbox"/> English</td> <td><input type="checkbox"/> Mathematics</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Foreign Language</td> <td><input type="checkbox"/> Reading / Language Arts</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Geography</td> <td><input type="checkbox"/> Science</td> <td></td> </tr> </table>			<input type="checkbox"/> Arts	<input type="checkbox"/> Civics and Government	<input checked="" type="checkbox"/> Not Core Subject	<input type="checkbox"/> Economics	<input type="checkbox"/> History		<input type="checkbox"/> English	<input type="checkbox"/> Mathematics		<input type="checkbox"/> Foreign Language	<input type="checkbox"/> Reading / Language Arts		<input type="checkbox"/> Geography	<input type="checkbox"/> Science	
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CDE CALPADS Course Descriptors: (See Page 2 for Definitions)	CTE TECH PREP COURSE INDICATORS <input checked="" type="checkbox"/> Tech Prep (32) (Higher Ed) <input type="checkbox"/> Tech Prep & ROP(33) (Higher Ed) <input type="checkbox"/> ROP (30) <input type="checkbox"/> N/A	CTE COURSE CONTENT CODE <input checked="" type="checkbox"/> CTE Introductory (01) <input type="checkbox"/> CTE Concentrator (02) <input type="checkbox"/> CTE Completer (03) <input type="checkbox"/> Voc Subject _____ <input type="checkbox"/> N/A	INSTRUCTIONAL LEVEL CODE <input type="checkbox"/> Remedial (35) <input type="checkbox"/> Honors UC-Certified (39) <input type="checkbox"/> Honors Non UC-Certified (34) <input type="checkbox"/> College (40) <input type="checkbox"/> N/A															
Length of Course:	<input checked="" type="checkbox"/> Year <input type="checkbox"/> Semester																	
Grade Level(s):	<input checked="" type="checkbox"/> 9 <input checked="" type="checkbox"/> 10 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 12																	
Credit:	<input checked="" type="checkbox"/> Number of credits: 10 <input checked="" type="checkbox"/> Meets graduation requirements (subject ICT) <input checked="" type="checkbox"/> Request for UC "a-g" requirements		<input checked="" type="checkbox"/> College Prep															

	CSU/UC requirement "g"	
	Career and Technical Education - Information and Communications Technology Pathway	
Prerequisites:	Completion of an Algebra 1 course. No previous computer science course is required to take this course.	
Department(s):	Math, Career and Technical Education	
District Sites:	ORHS, UMHS	
Board of Trustees COS Adoption Date:		
Textbooks / Instructional Materials:	<p>Title: Exploring Computer Science Edition: Version 5.0 Publication Date: 2013 Publisher: Author(s): Joanna Goode, University of Oregon; Gail Chapman, University of California, Los Angeles ISBN #: URL Resource(s): http://www.exploringcs.org/curriculum</p> <p>Scratch Programming Language http://www.scratch.mit.edu</p> <p>Lego Robots: 5003825 EV3 Software and Site License 1 @ \$399.95 = \$399.95 5003400 EV3 Core Set with Charger 20 @ \$339.95 = \$6,613.40</p>	
Funding Source:	CRANE, Site, CTE, Perkins	
Board of Trustees Textbook Adoption Date:	N/A	

Definitions

CALPADS	California Longitudinal Pupil Achievement Data System
CTE Technical Prep	A course within a CTE technical career pathway or program that has been articulated with a postsecondary education or through an apprenticeship program of at least 2 years following secondary instruction.
Instructional Level Code	Represents a nonstandard instructional level at which the content of a specific course is either above or below a 'standard' course instructional level. These levels may be identified by the actual level of instruction or identified by equating the course content and level of instruction with a state or nationally recognized advanced course of study, such as IB or AP.
Instructional Level Honors, UC Certified	Includes all AP courses.
Instructional Level Honors, non UC Certified	Requires Board approval.
Instructional Level College	Includes ACE courses. Equivalent to college course and content, but not an AP course. Not related to section, but to course.

EDUCATIONAL SERVICES

Course Title: Exploring Computer Science (#0455)

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EDUCATIONAL SERVICES

Department: **Math, Career and Technical Education**

Course Title: **Exploring Computer Science**

Course Number: **#0455**

Unit Title: **Unit 1: Human Computer Interaction**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Standards, Information and Communications Technologies Pathway

2.3 Interpret verbal communications and respond appropriately.
2.5 Communicate information and ideas effectively using a variety of media and formats.
2.7 Use technical writing and communication skills to work effectively with diverse groups of people.
4.4 Discern the quality and value of information collected using digital technologies, and recognize bias and intent of the associated sources.
5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.
8.8 Identify legal and ethical issues that have proliferated with increased technology adoption, including hacking, scamming, and breach of privacy.
10.1 Interpret and explain terminology and practices specific to the Information and Communication Technologies sector.
10.5 Understand the major software and hardware components of a computer and a network and how they relate to each other.
10.6 Understand data sizes of various types of information (text, pictures, sound, video, etc.) and data capacity of various forms of media.
10.9 Use common industry-standard software and their applications including word processing, spreadsheets, databases, and multimedia software.
10.12 Know appropriate search procedures for different types of information, sources, and queries.
10.13 Evaluate the accuracy, relevance, and comprehensiveness of retrieved information.
A3.5 Use multiple online search techniques and resources to acquire information.
C6.3 Use media design and editing software: keyframe animation, drawing software, image editors, and three-dimensional design.
C6.7 Create and/or capture professional-quality media, images, documents, audio, and video clips.
C10.1 Describe models of intelligent behavior and what distinguishes humans from machines.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

1. Computers and the internet
 - Analyze the characteristics of hardware components to determine the applications for which they can be used.
 - Use appropriate tools and methods to execute Internet searches which yield requested data.
 - Evaluate the results of web searches and the reliability of information found on the Internet.
2. Models of Intelligent Behavior
 - Explain the differences between tasks that can and cannot be accomplished with a computer.
3. Societal impacts of computing
 - Analyze the effects of computing on society within economic, social, and cultural contexts.
 - Communicate legal and ethical concerns raised by computing innovation.
 - Explain the implications of communication as data exchange.

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. This unit begins with a description of the topic, an explanation of the importance of this topic, possible social applications of this topic, and objectives for the unit.
2. A kinesthetic activity will be used to get students involved in the unit topic. Students are more engaged when they go beyond seatwork to gain familiarity with the scope of a topic. Acting out computing concepts is one way to have students actively engaged in the curriculum.
3. The final unit project is presented at the beginning of the unit so students understand what type of project they will engage in at the end of the unit. Daily assignments help scaffold their knowledge towards gaining the knowledge needed to complete a particular project. The final project represents a culmination of their new knowledge and provides an opportunity to expand their understandings to a particular socially-relevant problem.
4. Students will use writing to reinforce the literacy component behind computing terms and definitions.
5. Foundational computing topics are connected to the 'pop-technology' students have likely encountered: mobile phones, social networks, blogs, Internet browsing, etc.
6. Real world problems are presented in the context of socially-relevant issues impacting urban communities (housing, safety, poverty, health care, access to equal rights, educational opportunities, improving social services, translation services, transportation, etc.)
7. Students will work on problems that they help define and can individualize—i.e. selecting their own content for websites; creating original, not pre-scripted, problem-solving strategies, etc.
8. Students will work in a variety of collaborative settings including elbow partners, peer-programming, and group research projects. This collaboration encourages conversations around computing topics.
9. Students will communicate their answers in a variety of ways—academic writing, journal entries, writing a letter to a friend or companion, using presentation software, developing graphics or animation, storyboarding, listing algorithms, drawing illustrations, oral presentations, etc.
10. Computing careers will be explored in this unit. Students will be given hypothetical opportunities to act as a professional to take on the behavior and skills to solve a given problem.

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

Currently SRI International is developing unit assessment tools as well as summative assessments. These assessments are expected to be available during the 2014-2015 school year; check PACT website for updates: <http://pact.sri.com>

1. Analyze One's Own Computational Work and the Work of Others
2. Apply Abstractions and Models
3. Design and Implement Creative Solutions and Artifacts
4. Analyze Effects of Development in Computing
5. Connect Computing with Other Disciplines
6. Communicate Thoughts Processes and Results in Simple Formats
7. Work Effectively in Teams

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

SRI, in the Principled Assessment of Computational Thinking (PACT) project, is developing ways to assess the computational thinking practices—the big ideas that underlie the computer science discipline—that students acquire in the ECS curriculum. The project will provide intervention strategies for students who fail to master unit objectives.

EDUCATIONAL SERVICES

Department: **Math, Career and Technical Education**

Course Title: **Exploring Computer Science**

Course Number: **#0455**

Unit Title: **Unit 2: Problem Solving**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Standards, Information and Communications Technologies Pathway

2.3 Interpret verbal and nonverbal communications and respond appropriately.

2.4 Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.

2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

5.1 Identify and ask significant questions that clarify various points of view to solve problems.

5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.

5.5 Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.

5.7 Work out problems iteratively and recursively.

5.8 Create and use algorithms and solve problems.

5.5 Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.

5.10 Use multiple layers of abstraction.

5.11 Understand the concept of base systems, including binary and hexadecimal.

8.8 Identify legal and ethical issues that have proliferated with increased technology adoption, including hacking, scamming, and breach of privacy.

C4.10 Create and know the comparative advantages of various queue, sorting, and searching algorithms.

C6.3 Use media design and editing software: keyframe animation, drawing software, image editors, and three-dimensional design.

C8.8 Analyze and display data to assist with decision making using methods like cross tabulations, graphs, and charts.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

1. Algorithms and abstraction

- Name and explain the steps they use in solving a problem.
- Solve a problem by applying appropriate problem-solving techniques.
- Express a solution using standard design tools.
- Determine if a given algorithm successfully solves a stated problem.
- Create algorithms that meet specified objectives.
- Compare the tradeoffs between different algorithms for solving the same problem.
- Explain the characteristics of problems that cannot be solved by an algorithm.

2. Connections between Mathematics and Computer Science

- Explain the connections between binary numbers and computers.
- Summarize the behavior of an algorithm.

3. Societal impacts of computing

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

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2. A kinesthetic activity will be used to get students involved in the unit topic. Students are more engaged when they go beyond seatwork to gain familiarity with the scope of a topic. Acting out computing concepts is one way to have students actively engaged in the curriculum.

3. The final unit project is presented at the beginning of the unit so students understand what type of project they will engage in at the end of the unit. Daily assignments help scaffold their knowledge towards gaining the knowledge needed to complete a particular project. The final project represents a culmination of their new

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7. Students will work on problems that they help define and can individualize—i.e. selecting their own content for websites; creating original, not pre-scripted, problem-solving strategies, etc.
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Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

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EDUCATIONAL SERVICES

Department: **Math, Career and Technical Education**

Course Title: **Exploring Computer Science**

Course Number: **#0455**

Unit Title: **Unit 3: Web Design**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Standards, Information and Communications Technologies Pathway

C4.6 Use proper programming language syntax.

C6.1 Identify the basic design elements necessary to produce effective print, video, audio, and interactive media.

C6.3 Use media design and editing software: keyframe animation, drawing software, image editors, and three-dimensional design.

C6.6 Integrate media into a full project using appropriate tools.

C7.5 Create an online project, Web-based business, and e-portfolio.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

1. Web page design and development

- Create web pages to address specified objectives.
- Create web pages with a practical, personal, and/or societal purpose.
- Select appropriate techniques when creating web pages.
- Use abstraction to separate style from content in web page design and development.
- Describe the use of a website with appropriate documentation.

2. Computers and the internet

3. Algorithms and abstraction

4. Societal impacts of computing

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

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4. Students will use writing to reinforce the literacy component behind computing terms and definitions.

5. Foundational computing topics are connected to the 'pop-technology' students have likely encountered: mobile phones, social networks, blogs, Internet browsing, etc.

6. Real world problems are presented in the context of socially-relevant issues impacting urban communities (housing, safety, poverty, health care, access to equal rights, educational opportunities, improving social services, translation services, transportation, etc.)

7. Students will work on problems that they help define and can individualize—i.e. selecting their own content for websites; creating original, not pre-scripted, problem-solving strategies, etc.

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10. Computing careers will be explored in this unit. Students will be given hypothetical opportunities to act as a professional to take on the behavior and skills to solve a given problem.

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

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Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

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EDUCATIONAL SERVICES

Department: **Math, Career and Technical Education**

Course Title: **Exploring Computer Science**

Course Number: **#0455**

Unit Title: **Unit 4: Introduction to Programming**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Standards, Information and Communications Technologies Pathway

2.3 Interpret verbal and nonverbal communications and respond appropriately.

2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

5.8 Create and use algorithms and solve problems.

10.1 Interpret and explain terminology and practices specific to the Information and Communication Technologies sector.

C4.5 Demonstrate awareness of various programming paradigms, including procedural, object oriented, event-driven, and multithreaded programming.

C4.6 Use proper programming language syntax.

C4.9 Create programs using control structures, procedures, functions, parameters, variables, error recovery, and recursion.

C5.5 Evaluate results against initial requirements.

C6.4 Develop a presentation or other multimedia project: video, game, or interactive Web sites, from storyboard to production.

C6.6 Integrate media into a full project using appropriate tools.

D3.3 Using simple game development tools, create a game or simulation.

D3.4 Present the game or simulation.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

1. Programming

- Design, code, test, and execute a program that corresponds to a set of specifications.
- Select appropriate programming structures.
- Locate and correct errors in a program.
- Explain how a particular program functions.
- Justify the correctness of a program.

2. Algorithms and abstractions

- Use appropriate algorithms to solve a problem.

3. Connections between mathematics and computer science

4. Societal impacts of computing

- Create programs with practical, personal, and/or societal intent.

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

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3. The final unit project is presented at the beginning of the unit so students understand what type of project they will engage in at the end of the unit. Daily assignments help scaffold their knowledge towards gaining the knowledge needed to complete a particular project. The final project represents a culmination of their new knowledge and provides an opportunity to expand their understandings to a particular socially-relevant problem.

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EDUCATIONAL SERVICES

Department: **Math, Career and Technical Education**Course Title: **Exploring Computer Science**Course Number: **#0455**Unit Title: **Unit 5: Computing and Data Analysis****Content Area Standards** (Please identify the source): List content standards students will master in this unit.

California Career Technical Standards, Information and Communications Technologies Pathway

C5.5 Evaluate results against initial requirements.

C6.4 Develop a presentation or other multimedia project: video, game, or interactive

Web sites, from storyboard to production.

C6.6 Integrate media into a full project using appropriate tools.

D3.3 Using simple game development tools, create a game or simulation.

D3.4 Present the game or simulation. Technologies sector issues and problems.

10.1 Interpret and explain terminology and practices specific to the Information and Communication Technologies sector.

C6.4 Develop a presentation or other multimedia project: video, game, or interactive Web sites, from storyboard to production.

C8.5 Use queries to extract and manipulate data (select queries, action queries).

C8.8 Analyze and display data to assist with decision making using methods like cross tabulations, graphs, and charts.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

1. Data and information

- Describe the features of appropriate data sets for specific problems.
- Apply a variety of analysis techniques to large data sets.
- Compare different analysis techniques and discuss the tradeoffs among them.

2. Algorithms and abstraction

3. Connections between mathematics and computer science

4. Programming

- Use computers to find patterns in data and test hypotheses about data.

5. Societal impacts of computing

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

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EDUCATIONAL SERVICES

Department: **Math, Career and Technical Education**

Course Title: **Exploring Computer Science**

Course Number: **#0455**

Unit Title: **Unit 6: Robotics**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Standards, Information and Communications Technologies Pathway

2.3 Interpret verbal and nonverbal communications and respond appropriately.
2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
4.1 Use electronic reference materials to gather information and produce products and services.
5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.
5.5 Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.
5.8 Create and use algorithms and solve problems.
5.12 Apply the concepts of Boolean logic to decision making and searching.
9.7 Participate in interactive teamwork to solve real Information and Communication Technologies sector issues and problems.
10.1 Interpret and explain terminology and practices specific to the Information and Communication Technologies sector.
A6.2 Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.
A6.6 Distinguish types of symptoms and which component's issue could exhibit those symptoms: the user, hardware, network, or software.
C1.4 Work as a member of, and within the scope and boundaries of, a development project team.
C3.1 Describe and apply the basic process of input, processing, and output.
C4.9 Create programs using control structures, procedures, functions, parameters, variables, error recovery, and recursion.
C5.4 Test software and projects.
C5.5 Evaluate results against initial requirements.
C9.1 Demonstrate awareness of the applications of device development work, including personalized computing, robotics, and smart appliances.
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Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

1. Robotics
 - Identify the criteria that describe a robot and determine if something is a robot.
 - Match the actions of the robot to the corresponding parts of the program.
 - Explain ways in which different hardware designs affect the function of a machine.
2. Algorithms and abstraction
3. Connections between mathematics and computer science
4. Programming
 - Build, code, and test a robot that solves a stated problem.
 - Describe the tradeoffs among multiple ways to program a robot to achieve a goal.
5. Societal impacts of computing

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. This unit begins with a description of the topic, an explanation of the importance of this topic, possible social applications of this topic, and objectives for the unit.
2. A kinesthetic activity will be used to get students involved in the unit topic. Students are more engaged when they go beyond seatwork to gain familiarity with the scope of a topic. Acting out computing concepts is one way to have students actively engaged in the curriculum.
3. The final unit project is presented at the beginning of the unit so students understand what type of project they will engage in at the end of the unit. Daily assignments help scaffold their knowledge towards gaining the knowledge needed to complete a particular project. The final project represents a culmination of their new knowledge and provides an opportunity to expand their understandings to a particular socially-relevant problem.
4. Students will use writing to reinforce the literacy component behind computing terms and definitions.
5. Foundational computing topics are connected to the 'pop-technology' students have likely encountered: mobile phones, social networks, blogs, Internet browsing, etc.
6. Real world problems are presented in the context of socially-relevant issues impacting urban communities (housing, safety, poverty, health care, access to equal rights, educational opportunities, improving social services, translation services, transportation, etc.)
7. Students will work on problems that they help define and can individualize—i.e. selecting their own content for websites; creating original, not pre-scripted, problem-solving strategies, etc.
8. Students will work in a variety of collaborative settings including elbow partners, peer-programming, and group research projects. This collaboration encourages conversations around computing topics.
9. Students will communicate their answers in a variety of ways—academic writing, journal entries, writing a letter to a friend or companion, using presentation software, developing graphics or animation, storyboarding, listing algorithms, drawing illustrations, oral presentations, etc.
10. Computing careers will be explored in this unit. Students will be given hypothetical opportunities to act as a professional to take on the behavior and skills to solve a given problem.

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

Currently SRI International is developing unit assessment tools as well as summative assessments. These assessments are expected to be available during the 2014-2015 school year; check PACT website for updates: <http://pact.sri.com>

1. Analyze One's Own Computational Work and the Work of Others
2. Apply Abstractions and Models
3. Design and Implement Creative Solutions and Artifacts
4. Analyze Effects of Development in Computing
5. Connect Computing with Other Disciplines
6. Communicate Thoughts Processes and Results in Simple Formats
7. Work Effectively in Teams

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

SRI, in the Principled Assessment of Computational Thinking (PACT) project, is developing ways to assess the computational thinking practices—the big ideas that underlie the computer science discipline—that students acquire in the ECS curriculum. The project will provide intervention strategies for students who fail to master unit objectives.