Exploring Computer Science

Curriculum Mapping to Learning Standards

ISTE/NETS Edition

Acknowledgements

The ISTE/NETS standards included here are from http://www.iste.org/standards/nets-for-students. The same numbering scheme is used here as in the original documents.

Unit by Unit Overview of the ECS Curriculum Mapping to ISTE/NETS Standards

UNIT	UNIT OBJECTIVES	COMPUTATIONAL PRACTICES	ISTE/NETS STANDARDS
1	* 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. * Explain the differences between tasks that can and cannot be accomplished with a computer. * 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.	* Analyze the effects of developments in Computing * Design and implement creative solutions and artifacts. * Apply abstractions and models. * Connect computation with other disciplines. * Communicate thought processes and results. * Work effectively in teams.	1a. Apply existing knowledge to generate new ideas, products, or processes. 1b. Create original works as a means of personal or group expression. 1c. Use models and simulations to explore complex systems and issues. 2b. Communicate information and ideas effectively to multiple audiences using a variety of digital environments and media. 2d. Contribute to project teams to produce original works or solve problems. 3b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. 3c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks. 3d. Process data and report results. 4b. Plan and manage activities to develop a solution or complete a project. 5a. Advocate and practice safe, legal, and responsible use of information technology. 6a. Understand and use technology systems. 6b. Select and use applications effectively and productively.

			6d.	Transfer current knowledge to learning new technologies.
2	* Name and explain the steps they use in solving a problem.	* Analyze the effects of developments in computing.	1a.	Apply existing knowledge to generate new ideas, products, or processes.
	* Solve a problem by applying appropriate problem-solving techniques.	* Apply abstractions and models.	1b.	Create original works as a means of personal or group expression.
	* Express a solution using standard design tools.	* Connect computation with other disciplines.	1c.	Use models and simulations to explore complex systems and issues.
	* Determine if a given algorithm successfully solves a stated problem.	* Communicate thought processes and results.	2b.	Communicate information and ideas effectively to multiple audiences using a variety of digital environments and media.
	* Create algorithms that meet specified objectives.	* Work effectively in teams.	2d.	Contribute to project teams to produce original works or solve problems.
	* Explain the connections between binary numbers and computers.		3a.	Plan strategies to guide inquiry.
	* Summarize the behavior of an algorithm.		3b.	Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
	* Compare the tradeoffs between different algorithms for solving the same problem.		4b.	Plan and manage activities to develop a solution or complete a project.
	* Explain the characteristics of problems that cannot be solved by an algorithm.		4c.	Collect and analyze data to identify solutions and/or make informed decisions.
3	* Create web pages to address specified objectives.	* Analyze the effects of developments in computing.	1b.	Create original works as a means of personal or group expression.
	* Create web pages with a practical, personal, and/or societal purpose.	* Design and implement creative solutions and artifacts.	4b.	Plan and manage activities to develop a solution or complete a project.
	* Select appropriate techniques when creating web pages.	* Apply abstractions and models.	5a.	Advocate and practice safe, legal, and responsible use of information and technology.
	* Use abstraction to separate style from content in web page design and development.	* Analyze their computational work and the work of others.	6a.	Understand and use technology systems.
		* Communicate thought processes and results.	6b.	Select and use applications effectively and productively.

	* Describe the use of a website with appropriate documentation.		
4	* Use appropriate algorithms to solve a problem. * 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. * Create programs with practical, personal, and/or societal intent.	* Design and implement creative solutions and artifacts. * Analyze their computational work and the work of others. * Connect computation with other disciplines. * Communicate thought processes and results.	1c. Use models and simulations to explore complex systems and issues. 2b. Communicate information and ideas effectively to multiple audiences using a variety of digital environments and media. 4b. Plan and manage activities to develop a solution or complete a project. 6a. Understand and use technology systems.
5	* Describe the features of appropriate data sets for specific problems. * Apply a variety of analysis techniques to large data sets. * Use computers to find patterns in data and test hypotheses about data. * Compare different analysis techniques and discuss the tradeoffs among them. * Justify conclusions drawn from data analysis.	* Analyze the effects of developments in computing. * Design and implement creative solutions and artifacts. * Analyze their computational work and the work of others. * Connect computation with other disciplines. * Communicate thought processes and results. * Work effectively in teams.	1d. Identify trends and forecast possibilities. 2b. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media. 2d. Contribute to project teams to produce original works or solve problems. 3a. Plan strategies to guide inquiry. 3d. Process data and report results. 4b. Plan and manage activities to develop a solution or complete a project. 4c. Collect and analyze data to identify solutions and/or make informed decisions. 5a. Advocate and practice safe, legal, and responsible use of information and technology. 6a. Understand and use technology systems.

6	* Identify the criteria that describe a robot and determine if something is a robot.	* Design and implement creative solutions and artifacts.	2d.	Contribute to project teams to produce original works or solve problems.
	* Match the actions of the robot to the corresponding parts of the program.	* Communicate thought processes and results.	4b.	Plan and manage activities to develop a solution or complete a project.
	* Build, code, and test a robot that solves a stated problem.	* Work effectively in teams.	6a.	Understand and use technology systems.
	* Explain ways in which different hardware designs affect the function of a machine.			
	* Describe the tradeoffs among multiple ways to program a robot to achieve a goal.			