Dublin City Schools
STEAM
Graded Course of Study
2022

DCS STEAM Vision

Dublin City Schools is committed to providing purposeful STEAM learning experiences to students throughout their K-12 journey. These experiences will be in the form of integrated, interdisciplinary experiences as well as focused pathways in the areas of STEAM.

We commit to transforming STEAM into more than the integration of Science, Technology, Engineering, and Mathematics with vision to expand ownership to all disciplines and grade levels. By creating a culture of thinking, curiosity and creativity across content, students will engage in interest based learning that will help them develop the attitudes and skills that will support them in a variety of career and life pathways. These learning experiences will support students as lifelong, adaptable learners who can thrive in a quickly changing world.

We believe in STEAM learning for all students and commit to creating equitable access so that our STEAM classrooms are representative of our school populations and communities.

Instructional Agreements:

- We recognize the importance of early access and exposure to STEAM learning.
- We prioritize learning where students will identify and solve open-ended problems and engage in experiential learning.
- We will engage students through a lens of design thinking and promote opportunities for PBL.
- We will provide students with industry connections and experiences.
- We prioritize educating the whole child, in addition to our content. This includes a commitment to employability skills and emotional intelligence.
- We value students seeing themselves in STEAM fields.

Introduction to Cybersecurity

Introduction to Cybersecurity Course Goals: Students will learn valuable skills to get them started in the rapidly developing and advancing field of Cybersecurity through learning IT fundamentals. These skills will prepare them for valuable certification exams and provide the potential for internships in the Cybersecurity Academy. No prior knowledge of Cybersecurity or computer science is necessary, just a basic understanding of computers and computer systems. Networks, Systems Security, Cryptography, Information Security, Risk Identification, are among the topics covered in the course. Students complete online learning modules and participate in simulations and authentic, cybersecurity applications. Students may complete, as part of this course, related cybersecurity certifications such as: A+, Network+, Microsoft Security Fundamentals, and Security+.

Cybersecurity Basics		
Strand	**Topic**	**Content Statement**
Concepts and Terminology	CompTIA IT Fundamentals Certification	Compare and contrast notational systems. Compare and contrast fundamental data types and their characteristics. Illustrate the basics of computing and processing. Explain the value of data and information. Compare and contrast common units of measure. Explain the troubleshooting methodology.

Infrastructure		
Strand	**Topic**	**Content Statement**
Computing Systems	CompTIA IT Fundamentals Certification	Classify common types of input/output device interfaces. Given a scenario, set up and install common peripheral devices to a laptop/PC. Explain the purpose of common internal computing components. Compare and contrast common Internet service types. Compare and contrast storage types. Compare and contrast common computing devices and their purposes. Identify different multifunctional computing devices and connection technologies, both virtual and physical, to describe their purpose.
	Devices (OH Comp Sci)	CS.D.9-12.F.a Identify different multifunctional computing devices and connection technologies, both virtual and physical, to describe their purpose.

Applications and Software		
Strand	**Topic**	**Content Statement**
Computing Systems	CompTIA IT Fundamentals Certification	Explain the purpose of operating systems. Compare and contrast components of an operating system. Explain the purpose and proper use of software.

		Explain methods of application architecture and delivery models. Given a scenario, configure and use web browsers. Compare and contrast general application concepts and uses. Compare and contrast interactions between application software, system software and hardware. Apply a systemic process to identify problems and take steps to correct them within an integrated computing system.
	Hardware and Software (OH Comp Sci)	CS.HS.9-12.F.a Compare and contrast interactions between application software, system software and hardware.
	Troubleshooting (OH Comp Sci)	CS.T.9-12.F.a Apply a systemic process to identify problems and take steps to correct them within an integrated computing system.

Software Development Concepts		
Strand	**Topic**	**Content Statement**
Programming	CompTIA IT Fundamentals Certification	Compare and contrast programming language categories. Given a scenario, use programming organizational techniques and interpret logic. Explain the purpose and use of programming concepts.

Database Fundamentals		
Strand	**Topic**	**Content Statement**
Data and Analysis	CompTIA IT Fundamentals Certification	Explain database concepts and the purpose of a database. Compare and contrast various database structures. Summarize methods used to interface with databases. Investigate data storage systems to compare and contrast how data is stored and accessed.
	Data Collection and Storage (OH Comp Sci)	DA.DCS.9-12.F.b Investigate data storage systems to compare and contrast how data is stored and accessed.

Security		
Strand	**Topic**	**Content Statement**
Networks and the Internet	CompTIA IT Fundamentals Certification	Summarize confidentiality, integrity and availability concerns. Explain methods to secure devices and best practices. Summarize behavioral security concepts. Examine and employ principles of cybersecurity. Identify physical, social and digital security risks to address possible attacks.
	Cybersecurity (OH Comp Sci)	NI.C.9-12.F.a Examine and employ principles of cybersecurity.

		NI.C.9-12.F.b Identify physical, social and digital security risks to address possible attacks.

Algorithmic Thinking and Programming		
Strand	**Topic**	**Content Statement**
Algorithmic Thinking and Programming (OH Comp Sci)	**Algorithms**	ATP.A.9-12.F.a Define and use appropriate problem solving strategies and visual artifacts to create and refine a solution to a real world problem.
	Control Structures	ATP.CS.9-12.F.a Define control structures and Boolean logic and use them to solve real-world scenarios. ATP.CS.9-12.F.b Use appropriate syntax to create and use a method. ATP.CS.9-12.F.c Use data scoping to isolate data.
	Variables and Date Representation	ATP.VDR.9-12.F.a Identify types of variables and data and utilize them to create a computer program that stores data in appropriate ways.
	Modularity	ATP.M.9-12.F.b Create computational artifacts by systematically organizing, manipulating and/or processing data. ATP.VDR.9-12.A.a Utilize different data storage structures to store larger and more complex data than variables can contain.

Impacts of Computing		
Strand	**Topic**	**Content Statement**
Impacts of Computing (OH Comp Sci)	**Culture**	IC.Cu.9-12.F.a Analyze new technology to predict realistic impacts on society.
	Social Interactions	IC.SI.9-12.F.a Evaluate tools to increase connectivity of people in different cultures and career fields.
	Safety, Law and Ethics	IC.SLE.9-12.F.a Interpret and analyze breaches in privacy and security to investigate the legal and ethical impact. IC.SLE.9-12.F.b Analyze the concepts of usability and security to explain typical tradeoffs between them. IC.SLE.9-12.F.d Explain the beneficial and harmful effects of intellectual property laws to determine the impacts on innovation.