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.

Product Design and Modeling - High School

Product Design and Modeling Course Goals:

Students will study the basic concepts of product and package design. Students will learn how to identify and clarify a problem, make an in-depth response and then create and test their solutions. Human-factors, engineering and production techniques are integral to this course.

Safety		
Strand	**Topic**	**Content Statement**
Equipment Safety	Tools and Habits	Develop safe workshop habits using power tools and hand tools.

Ergonomics and Human Factors		
Strand	**Topic**	**Content Statement**
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.DT.4.a Evaluate project/product solutions and communicate observations of the entire design process results. 9-12.DT.4.b Interpret data/information related to product testing to determine revisions and modifications to a design's function and aesthetics. 9-12.DT.4.c Critically evaluate a design solution at multiple points of a design process. Consider design requirements and adjust processes and outcomes as needed. 9-12.DT.4.d Explain the interrelationship between technology, creativity and innovation.

Product Prototyping, Testing, and Redesign		
Strand	**Topic**	**Content Statement**
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.DT.4.a Evaluate project/product solutions and communicate observations of the entire design process results. 9-12.DT.4.b Interpret data/information related to product testing to determine revisions and modifications to a design's function and aesthetics. 9-12.DT.4.c Critically evaluate a design solution at multiple points of a design process. Consider design requirements and adjust processes and outcomes as needed.

Custom Product Design Project: A		
Strand	**Topic**	**Content Statement**
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.DT.4.a Evaluate project/product solutions and communicate observations of the entire design process results. 9-12.DT.4.b Interpret data/information related to product testing to determine revisions and modifications to a design's function and aesthetics. 9-12.DT.4.c Critically evaluate a design solution at multiple points of a design process. Consider design requirements and adjust processes and outcomes as needed.

Project and Portfolio Development		
Strand	**Topic**	**Content Statement**
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.b Implement, document and present a design process as applied to a particular product, process or problem.
	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.DT.4.a Evaluate project/product solutions and communicate observations of the entire design process results
Information and Communications Technology (OH Tech) The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.	3. Use digital learning tools and resources to construct knowledge.	9-12.ICT.3.c Create artifacts using digital learning tools and resources to demonstrate knowledge.

Marketing		
Strand	**Topic**	**Content Statement**
Design and	4. Use digital learning tools and	9-12.DT.4.a Evaluate project/product solutions and communicate

Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	resources to communicate and disseminate information to multiple audiences.	observations of the entire design process results. 9-12.DT.4.b Interpret data/information related to product testing to determine revisions and modifications to a design's function and aesthetics. 9-12.DT.4.c Critically evaluate a design solution at multiple points of a design process. Consider design requirements and adjust processes and outcomes as needed. 9-12.DT.4.d Explain the interrelationship between technology, creativity and innovation.

Sustainable and Green Design		
Strand	**Topic**	**Content Statement**
Society and Technology (OH Tech) The interconnected-ness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.	3. Explain how technology, society and the individual impact one another.	9-12.ST.3.a Debate how demand for technology and innovation have reshaped the social, cultural, political and/or economic landscape, citing references and examples. 9-12.ST.3.b Discuss how technological innovation has resulted when ideas, knowledge or skills have been shared across multiple fields
	1. Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.	9-12.ST.1.b Debate the advantages and disadvantages of widespread use, accessibility, and reliance on technology in one's world, in the workplace and in global society.

Custom Product Design		
Strand	**Topic**	**Content Statement**
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.a Evaluate a design solution using conceptual, physical, digital and mathematical models at various intervals of a design process in order to check for proper design and note areas where improvements are needed (e.g., check the design solutions against criteria and constraints).

Digital Portfolio Development		
Strand	**Topic**	**Content Statement**
Information and Communications Technology (OH Tech) The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.ICT.4.a Use digital learning tools and resources to identify communication needs considering goals, audience, content, access to tools or devices, timing of communication (e.g., time zones), etc. 9-12.ICT.4.b Based on communication needs, develop, implement and evaluate a communication plan to disseminate information to multiple audiences. 9-12.ICT.4.c Integrate accessibility principles to effectively communicate to, and meet the needs of, multiple audiences. 9-12.ICT.4.d Use digital learning tools to represent and model complex systems of information to a target audience.

Project Design Application		
Strand	**Topic**	**Content Statement**
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.a Evaluate a design solution using conceptual, physical, digital and mathematical models at various intervals of a design process in order to check for proper design and note areas where improvements are needed (e.g., check the design solutions against criteria and constraints). 9-12.DT.2.b. Implement, document and present a design process as applied to a particular product, process or problem.