PLTW Computer Science Standards Connection
Computer Science Essentials

Connections to Standards in Computer Science

PLTW curriculum is designed to empower students to thrive in an evolving world. As a part of the design process when developing and updating our curriculum, we focus on connections to a variety of standards. PLTW Computer Science Essentials connects to standards in the following:

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Computer Science Teachers Association K-12 Computer Science

Computing Systems

3A-CS-01

Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-CS-02

Compare levels of abstraction and interactions between application software, system software, and hardware layers.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-CS-03

Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Networks and the Internet

3A-NI-05

Give examples to illustrate how sensitive data can be affected by malware and other attacks.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-NI-06

Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Data and Analysis

3A-DA-10

Evaluate the tradeoffs in how data elements are organized and where data is stored.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Computer Science Teachers Association K-12 Computer Science

Algorithms and Programming

3A-AP-13

Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-14

Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-15

Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-16

Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-17

Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-18

Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-19

Systematically design and develop programs for broad audiences by incorporating feedback from users.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-21

Evaluate and refine computational artifacts to make them more usable and accessible.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-22

Design and develop computational artifacts working in team roles using collaborative tools.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-AP-23

Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Impacts of Computing

3A-IC-24

Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-IC-25

Test and refine computational artifacts to reduce bias and equity deficits.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-IC-26

Demonstrate ways a given algorithm applies to problems across disciplines.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Computer Science Teachers Association K-12 Computer Science

3A-IC-27

Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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3A-IC-30

Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Standards for Technological and Engineering Literacy

STEL 1 Nature and Characteristics of Technology and Engineering

STEL-1N

Explain how the world around them guides technological development and engineering design.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL-1Q

Conduct research to inform intentional inventions and innovations that address specific needs and wants.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL 2 Core Concepts of Technology and Engineering

STEL-2Y

Implement quality control as a planned process to ensure that a product, service, or system meets established criteria.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL-2Z

Use management processes in planning, organizing, and controlling work.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL 3 Integration of Knowledge, Technologies, and Practices

STEL-3I

Evaluate how technology enhances opportunities for new products and services through globalization.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL 4 Impacts of Technology

STEL-4P

Evaluate ways that technology can impact individuals, society, and the environment.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Standards for Technological and Engineering Literacy

STEL 5 Influence of Society on Technological Development

STEL-5H

Evaluate a technological innovation that arose from a specific society's unique need or want.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL-5I

Evaluate a technological innovation that was met with societal resistance impacting its development.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL 6 History of Technology

STEL-6H

Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL 7 Design in Technology and Engineering Education

STEL-7W

Determine the best approach by evaluating the purpose of the design.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL-7Z

Apply principles of human-centered design.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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STEL-7CC

Apply a broad range of design skills to their design process.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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Standards for Technological and Engineering Literacy

STEL 8 Applying, Maintaining, and Assessing Technological Products and Systems

STEL-8N

Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

Unit 1			Unit 2			Unit 3			Unit 4
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1
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References

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International Technology and Engineering Educators Association. (2020). *Standards for technological and engineering literacy: The role of technology and engineering in STEM education*. Retrieved from https://www.iteea.org/STEL.aspx