

# PLTW Gateway Standards Connection

## Computer Science for Innovators and Makers



### Connections to Standards in PLTW Gatew

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 for Innovators and Makers connects to standards in the following:

### Table of Contents

Common Core College and Career Readiness Anchor Standards	Page 2
Common Core State Standards for English Language Arts 6–8 Literacy Standards for History/Social Studies, Science, and Technical Subjects	Page 5
Common Core State Standards for English Language Arts 6th Grade	Page 7
Common Core State Standards for English Language Arts 7th Grade	Page 11
Common Core State Standards for English Language Arts 8th Grade	Page 15
International Society for Technology in Education	Page 18
Standards for Technological and Engineering Literacy	Page 21
K12 Computer Science Framework	Page 23
The Computer Science Teachers Association Standards	Page 26
Next Generation Science Standards	Page 29

# Common Core College and Career Readiness Anchor Standards

---

## Reading

Range of Reading and Level of Text Complexity

CCSS.ELA-LITERACY.CCRA.R.10

Read and comprehend complex literary and informational texts independently and proficiently.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Writing

Text Types and Purposes

CCSS.ELA-LITERACY.CCRA.W.2

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

CCSS.ELA-LITERACY.CCRA.W.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Speaking and Listening

Comprehension and Collaboration

CCSS.ELA-LITERACY.CCRA.SL.1

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Common Core College and Career Readiness Anchor Standards

## CCSS.ELA-LITERACY.CCRA.SL.2

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

## CCSS.ELA-LITERACY.CCRA.SL.4

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

## CCSS.ELA-LITERACY.CCRA.SL.5

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

## CCSS.ELA-LITERACY.CCRA.SL.6

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Language

### Vocabulary Acquisition and Use

#### CCSS.ELA-LITERACY.CCRA.L.4

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Common Core College and Career Readiness Anchor Standards

## CCSS.ELA-LITERACY.CCRA.L.5

Demonstrate understanding of word relationships and nuances in word meanings.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

## CCSS.ELA-LITERACY.CCRA.L.6

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

© Copyright 2010 National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

# Common Core State Standards for English Language Arts 6–8 Literacy Standards for History/Social Studies, Science, and Technical Subjects

---

## Reading Science/Technical

### Key Ideas and Details

#### CCSS.ELA-LITERACY.RST.6-8.2

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.RST.6-8.3

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Craft and Structure

#### CCSS.ELA-LITERACY.RST.6-8.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Range of Reading and Level of Text Complexity

#### CCSS.ELA-LITERACY.RST.6-8.10

By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Common Core State Standards for English Language Arts 6–8 Literacy Standards for History/Social Studies, Science, and Technical Subjects

---

## Writing in History/Social Studies, Science, and Technical Subjects

### Text Types and Purposes

#### CCSS.ELA-LITERACY.WHST.6-8.2

Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.WHST.6-8.2.d

Use precise language and domain-specific vocabulary to inform about or explain the topic.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Production and Distribution of Writing

#### CCSS.ELA-LITERACY.WHST.6-8.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Research to Build and Present Knowledge

#### CCSS.ELA-LITERACY.WHST.6-8.9

Draw evidence from informational texts to support analysis, reflection, and research.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

© Copyright 2010 National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

# Common Core State Standards for English Language Arts 6th Grade

---

## Reading Informational

### Key Ideas and Details

CCSS.ELA-LITERACY.RI.6.2

Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

### Craft and Structure

CCSS.ELA-LITERACY.RI.6.4

Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

---

## Writing

### Text Types and Purposes

CCSS.ELA-LITERACY.W.6.2.d

Use precise language and domain-specific vocabulary to inform about or explain the topic.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

CCSS.ELA-LITERACY.W.6.3.d

Use precise words and phrases, relevant descriptive details, and sensory language to convey experiences and events.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

# Common Core State Standards for English Language Arts 6th Grade

## Production and Distribution of Writing

### CCSS.ELA-LITERACY.W.6.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3.)

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

## Research to Build and Present Knowledge

### CCSS.ELA-LITERACY.W.6.9

Draw evidence from literary or informational texts to support analysis, reflection, and research.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

---

## Speaking and Listening

### Comprehension and Collaboration

#### CCSS.ELA-LITERACY.SL.6.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

#### CCSS.ELA-LITERACY.SL.6.1.a

Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

#### CCSS.ELA-LITERACY.SL.6.1.b

Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2



# Common Core State Standards for English Language Arts 6th Grade

## CCSS.ELA-LITERACY.SL.6.1.c

Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

## CCSS.ELA-LITERACY.SL.6.2

Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

## Presentation of Knowledge and Ideas

### CCSS.ELA-LITERACY.SL.6.5

Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### CCSS.ELA-LITERACY.SL.6.6

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Language

### Vocabulary Acquisition and Use

#### CCSS.ELA-LITERACY.L.6.4

Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Common Core State Standards for English Language Arts 6th Grade

## CCSS.ELA-LITERACY.L.6.6

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

© Copyright 2010 National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

# Common Core State Standards for English Language Arts 7th Grade

---

## Reading Literature

### Key Ideas and Details

CCSS.ELA-LITERACY.RL.7.1

Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

---

## Writing

### Text Types and Purposes

CCSS.ELA-LITERACY.W.7.2.d

Use precise language and domain-specific vocabulary to inform about or explain the topic.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

CCSS.ELA-LITERACY.W.7.3.d

Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

### Production and Distribution of Writing

CCSS.ELA-LITERACY.W.7.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 7.w.1–3)

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

# Common Core State Standards for English Language Arts 7th Grade

## Speaking and Listening

### Comprehension and Collaboration

#### CCSS.ELA-LITERACY.SL.7.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.7.1.a

Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.7.1.b

Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.7.1.c

Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.7.1.d

Acknowledge new information expressed by others and, when warranted, modify their own views.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Common Core State Standards for English Language Arts 7th Grade

## Presentation of Knowledge and Ideas

### CCSS.ELA-LITERACY.SL.7.5

Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

- 1.1    1.2    1.3    1.4    1.5  
 2.1    2.2    2.3    2.4  
 3.1    3.2

### CCSS.ELA-LITERACY.SL.7.6

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

- 1.1    1.2    1.3    1.4    1.5  
 2.1    2.2    2.3    2.4  
 3.1    3.2

---

## Language

### Knowledge of Language

#### CCSS.ELA-LITERACY.L.7.3.a

Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.

- 1.1    1.2    1.3    1.4    1.5  
 2.1    2.2    2.3    2.4  
 3.1    3.2

### Vocabulary Acquisition and Use

#### CCSS.ELA-LITERACY.L.7.4

Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 7 reading and content, choosing flexibly from a range of strategies.

- 1.1    1.2    1.3    1.4    1.5  
 2.1    2.2    2.3    2.4  
 3.1    3.2

# Common Core State Standards for English Language Arts 7th Grade

## CCSS.ELA-LITERACY.L.7.6

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

© Copyright 2010 National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

# Common Core State Standards for English Language Arts 8th Grade

---

## Writing

### Text Types and Purposes

CCSS.ELA-LITERACY.W.8.2.d

Use precise language and domain-specific vocabulary to inform about or explain the topic.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

CCSS.ELA-LITERACY.W.8.3.d

Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Production and Distribution of Writing

CCSS.ELA-LITERACY.W.8.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3.)

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Research to Build and Present Knowledge

CCSS.ELA-LITERACY.W.8.9

Draw evidence from literary or informational texts to support analysis, reflection, and research.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Common Core State Standards for English Language Arts 8th Grade

## Speaking and Listening

### Comprehension and Collaboration

#### CCSS.ELA-LITERACY.SL.8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.8.1.a

Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.8.1.b

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

#### CCSS.ELA-LITERACY.SL.8.1.d

Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Presentation of Knowledge and Ideas

#### CCSS.ELA-LITERACY.SL.8.5

Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2



# Common Core State Standards for English Language Arts 8th Grade

---

## Language

### Vocabulary Acquisition and Use

#### CCSS.ELA-LITERACY.L.8.6

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

1.1     1.2     1.3     1.4     1.5

2.1     2.2     2.3     2.4

3.1     3.2

© Copyright 2010 National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

## Empowered Learner

1a

Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2
- 

## Digital Citizen

2b

Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2
- 

## Knowledge Constructor

3d

Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2
- 

## Innovative Designer

4a

Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# International Society for Technology in Education

4b

Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

4c

Students develop, test and refine prototypes as part of a cyclical design process.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Computational Thinker

5c

Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Creative Communicator

6b

Students create original works or responsibly repurpose or remix digital resources into new creations.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

6c

Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

## Global Collaborator

7b

Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

7c

Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Standards for Technological and Engineering Literacy

---

## Nature and Characteristics of Technology and Engineering

### STEL-1J

Develop innovative products and systems that solve problems and extend capabilities based on individual or collective needs and wants.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Core Concepts of Technology and Engineering

### STEL-2M

Differentiate between inputs, processes, outputs, and feedback in technological systems.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### STEL-2S

Defend decisions related to a design problem.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Design in Technology and Engineering Education

### STEL-7Q

Apply the technology and engineering design process.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### STEL-7R

Refine design solutions to address criteria and constraints.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Standards for Technological and Engineering Literacy

## STEL-7S

Create solutions to problems by identifying and applying human factors in design.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

## STEL-7U

Evaluate the strengths and weaknesses of different design solutions.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

## STEL-7V

Improve essential skills necessary to successfully design.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# K12 Computer Science Framework

---

## Fostering an Inclusive Computing Culture

### P1.FICC.1

Include the unique perspectives of others and reflect on one's own perspectives when designing and developing computational products.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### P1.FICC.2

Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### P1.FICC.3

Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Collaborating Around Computing

### P2.CAC.1

Cultivate working relationships with individuals possessing diverse perspectives, skills, and personalities.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### P2.CAC.2

Create team norms, expectations, and equitable workloads to increase efficiency and effectiveness.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# K12 Computer Science Framework

## P2.CAC.3

Solicit and incorporate feedback from, and provide constructive feedback to, team members and other stakeholders.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Recognizing and Defining Computational Problems

### P3.RDCP.2

Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

---

## Creating Computational Artifacts

### P5.CCA.1

Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### P5.CCA.2

Create a computational artifact for practical intent, personal expression, or to address a societal issue.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### P5.CCA.3

Modify an existing artifact to improve or customize it.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2



# K12 Computer Science Framework

---

## Testing and Refining Computational Artifacts

### P6.TRCA.1

Systematically test computational artifacts by considering all scenarios and using test cases.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### P6.TRCA.2

Identify and fix errors using a systematic process.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### P6.TRCA.3

Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Communicating About Computing

### P7.CAC.2

Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# The Computer Science Teachers Association Standards

In June 2018 PLTW submitted all necessary documentation required by the Computer Science Teachers Association (CSTA) for a CSTA Curriculum Task Force crosswalk review of our Launch and Gateway curricula. While we fully anticipate approval and validation by CSTA, review is still pending at this time.

---

## Computing Systems

### Devices

#### 2-CS-01

Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. [C] CS: Devices [P] Computational Problems (3.3)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### Hardware & Software

#### 2-CS-02

Design projects that combine hardware and software components to collect and exchange data. [C] CS: Hardware & Software [P] Creating (5.1)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### Troubleshooting

#### 2-CS-03

Systematically identify and fix problems with computing devices and their components. [C] CS: Troubleshooting [P] Testing (6.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Networks & the Internet

### Network Communication & Organization

#### 2-NI-04

Model the role of protocols in transmitting data across networks and the Internet. [C] NI: Network Communication & Organization [P] Abstraction (4.4)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# The Computer Science Teachers Association Standards

## Cybersecurity

### 2-NI-06

Explain how physical and digital security measures protect electronic information. [C] NI: Cybersecurity [P] Communicating (7.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Algorithms & Programming

### Algorithms

#### 2-AP-10

Use flowcharts and/or pseudocode to address complex problems as algorithms. [C] AP: Algorithms [P] Abstraction (4.4, 4.1)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### Variables

#### 2-AP-11

Create clearly named variables that represent different data types and perform operations on their values. [C] AP: Variables [P] Creating (5.1, 5.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### Modularity

#### 2-AP-13

Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. [C] AP: Modularity [P] Computational Problems (3.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# The Computer Science Teachers Association Standards

## Program Development

### 2-AP-15

Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. [C]

AP: Program Development [P] Collaborating (2.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### 2-AP-16

Seek and incorporate feedback from team members and users to refine a solution that meets user needs. [C]

AP: Program Development [P] Collaborating (2.3), Inclusion (1.1)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### 2-AP-18

Systematically test and refine programs using a range of test cases. [C] AP: Program Development [P] Testing (6.1)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

### 2-AP-19

Document programs in order to make them easier to follow, test, and debug. [C] AP: Program Development [P] Communicating (7.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

---

## Impacts of Computing

### Culture

#### 2-IC-20

Discuss issues of bias and accessibility in the design of existing technologies. [C] IC: Culture [P] Inclusion (1.2)

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

# Next Generation Science Standards

---

## Engineering Design

### NGSS.MS-ETS1-2

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

- 1.1     1.2     1.3     1.4     1.5
  - 2.1     2.2     2.3     2.4
  - 3.1     3.2
- 

## Science and Engineering Practices

### Asking Questions and Defining Problems

#### NGSS.P1

Asking questions and defining problems in 6-8 builds on K-5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Using Mathematics and Computational Thinking

#### NGSS.P5

Create algorithms (a series of ordered steps) to solve a problem.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

### Constructing Explanations and Designing Solutions

#### NGSS.P6

Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

- 1.1     1.2     1.3     1.4     1.5
- 2.1     2.2     2.3     2.4
- 3.1     3.2

# Next Generation Science Standards

## NGSS.P6

- Optimize performance of a design by prioritizing criteria, making tradeoffs, testing, revising, and retesting.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

## NGSS.P7

- Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

## Obtaining, Evaluating, and Communicating Information

### NGSS.P8

- Communicate scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.

- 1.1    1.2    1.3    1.4    1.5
- 2.1    2.2    2.3    2.4
- 3.1    3.2

## References

---

Computer Science Teachers Association. (2017). *CSTA K-12 CS Standards. Revised 2017*. Retrieved from <http://www.csteachers.org/standards>

International Society for Technology in Education. (2020) *ISTE Standards For Students*. Retrieved from <http://www.iste.org/standards/for-students>

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>

K-12 Computer Science Framework. (2016). Retrieved from <http://www.k12cs.org>.

National Governors Association Center for Best Practices, & Council of Chief State School Officers. (2010). *Common Core State Standards*. Washington, DC: National Governors Association Center for Best Practices, Council of Chief State School Officers. Retrieved from <http://www.corestandards.org/read-the-standards/>