Essential Standards Extended Guide

Digital Literacy

Guiding Information:

- **Essential standards** are explicitly taught, assessed multiple times, and receive targeted interventions for students who have not yet reached proficiency.
- **Supporting standards** are taught to reinforce essential standards and may or may not be formally assessed.

This guidance helps LEAs prioritize the most critical standards, recognizing that not all standards are of equal importance. This document serves as a resource—not a mandate—to assist local efforts.

Computer Science

Essential Standards Standards are to be explicitly taught, assessed more than once, and intervened upon in this cluster of standards.	Unit/lesson(s)	Justification/Rationale
9-12.CS.1.4 Create or modify a program that uses different forms of input and output.	2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13	Each identified lesson: ● Uses varied input (user commands, parameters, conditions) ● Produces varied output (text, graphics, movement)
9-12.CS.1.6 Create a model of how embedded systems sense, process, and interact in a given environment.	3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.9, 3.10, 3.13	Each identified lesson: ● Shows sensing (data types, sensors, IoT devices) ● Shows processing (hardware, software, AI models) ● Shows interaction (outputs, user interfaces, automation)

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9-12.CS.2.6 Compare and contrast the viewpoints on cybersecurity from the perspective of security experts, privacy advocates, and the government.	4.6, 5.4, 6.3	● 4.6 - includes open-ended discussion on rules / regulations, government oversight, etc. ● 5.4 - compares multiple stakeholder perspectives on data rights and privacy ● 6.3 - weighs benefits vs. privacy risks of new tech through multiple perspectives and discussion
9-12.CS.3.4 Identify and evaluate the beneficial and harmful effects of computing innovations on behavior and culture.	1.2, 1.4, 1.5, 1.7, 1.10, 1.12, 2.1, 2.10, 3.1, 3.11, 3.13, 4.10, 5.3, 5.4, 6.1, 6.2, 6.3, 6.4, 6.5, 6.7	● 1.10 - evaluates AI's benefits/harms on creativity, affecting behavior and cultural views on authorship and collaboration. ● 3.1 - Examines computing innovations' impacts on behavior and culture across industries. ● 3.11 - Evaluates impacts of computing innovations through accessibility, bias, and equitable design choices, showing effects on user groups and culture. ● 3.13 - Designs AI-based systems for real-world issues, evaluating ethical implications and societal impacts, connecting to behavior and culture via SDG goals. ● 4.10 - Students present innovations considering benefits, harms, and multiple perspectives. ● 5.3 - Students analyze data collection ethics from multiple viewpoints, including privacy, consent, fairness, and potential misuse. ● 5.4 - Students compare perspectives on data rights from multiple stakeholders, aligning with evaluating viewpoints in cybersecurity/privacy contexts. ● 6.1 - Students examine how online interactions can cause harm and influence behavior and culture. ● 6.2 - Students evaluate positive and negative effects of online advertising and disinformation from multiple perspectives.

Essential Standards Standards are to be explicitly taught, assessed more than once, and intervened upon in this cluster of standards.	Unit/lesson(s)	Justification/Rationale
		• 6.3 - Students evaluate both benefits and harms of new technologies, focusing on their impact on privacy, behavior, and society. • 6.4 - Students examine how digital footprints can help or harm future opportunities, directly evaluating beneficial and harmful effects of online behavior. • 6.5 - Students identify and evaluate benefits and drawbacks of online tracking for both companies and users, taking a position for or against specific examples. • 6.7 - Students evaluate copyright's benefits and harms, considering societal impacts.
9-12.CS.3.5 Debate how the issues of equity, data access, and distribution of computing resources create a digital divide in a global society.	5.4, 5.10	
9-12.CS.3.8 Research and explain the social, moral, ethical, and legal impacts of artificial intelligence systems and respective usage.	1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.10, 1.11, 1.12, 1.13, 2.3, 3.9, 3.10, 3.12, 4.3, 4.4, 4.6	
9-12.CS.5.2 Design algorithms using sequence, selection, iteration and recursion. *Recursion will be addressed in an upper computer science course.	2.3, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13	2.3 - Students design algorithms with sequencing, selection, and iteration, creating and refining flowcharts for real-world scenarios.

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
9-12 CS.5.1 Diagram the flow and execution and output of a given program.	2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.12, 2.13	
9-12.CS.3.2 Explain the social and economic implications associated with unethical computing practices.	1.2, 1.4, 1.7. 1.10, 1.12, 2.10, 3.11, 3.13, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.3, 5.4, 5.5, 5.8, 5.9, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7	• 1.2 - Students examine privacy risks and ethical concerns of AI image processing, connecting them to real-world social and economic impacts. • 1.4 - Students analyze AI errors and risks in real-world contexts, addressing social and economic consequences of unreliable or unethical AI use. • 1.7 - Analyzes real-world AI errors and harms, linking to social and economic impacts. • 1.10 - Examines AI's creative role, human judgment, and ethical implications in content creation. • 1.12 - Students analyze AI's societal and environmental impacts, identify who benefits or is harmed, and propose equitable solutions. • 2.10 - Students evaluate bias, fairness, and transparency in algorithms, directly addressing social and economic implications of unethical computing practices. • 3.11 - Students examine bias, inequity, and accessibility in user testing, showing social and economic impacts of unethical computing. • 3.13 - Students design AI-based systems addressing real-world issues, integrating ethical considerations and assessing social/economic impacts of design choices.

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
		• 4.7 - Students consider intended/unintended impacts of innovations, including harmful societal and economic effects, aligning with ethical computing practices. • 5.5 - Students consider ethical implications when forming data questions, addressing potential harm and respectful data use. • 5.9 - Students discuss how different visualizations can lead to varied interpretations, highlighting ethical implications of data presentation. • 6.1 - Students analyze online dilemmas, consider perspectives, and evaluate social impacts of digital actions. • 6.2 - Students examine how clickbait and online ads fuel disinformation and discuss responsibilities for addressing unethical practices. • 6.3 - Students weigh benefits vs. privacy risks of new tech, discussing social and ethical implications. • 6.4 - Students analyze how online behavior affects future opportunities, linking unethical digital actions to social and economic consequences. • 6.5 - Students evaluate the benefits and harms of online tracking, addressing its ethical, social, and economic impacts. • 6.6 - Students analyze misinformation and disinformation, exploring their social and cultural consequences. • 6.7 - Students evaluate benefits/harms of copyright policy, supporting claims with evidence.

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
9-12.CS.3.3 Discuss trade-offs such as privacy, safety, and convenience associated with the collection and large-scale analysis of personal information.	1.12, 2.10, 3.12, 4.2, 4.3, 4.6, 5.3, 5.4, 6.3, 6.5	• 1.12 - Students investigate real-world AI use, assess societal and environmental impacts, and propose equitable solutions • 2.10 - Students analyze real-world algorithms for bias, fairness, and transparency, considering ethical trade-offs and impacts on people's lives. • 3.12 - Evaluates ethical impacts of AI, including data privacy, consent, and societal effects, from multiple stakeholder perspectives. • 4.2 - students examine privacy policies, identify types of personal data collected, and consider privacy implications • 4.3 - Students analyze privacy, security, and convenience tradeoffs using real-world examples • 4.6 - Students analyze Equifax breach benefits, harms, and security risks, weighing privacy, safety, and convenience in data collection and use. • 5.3 - Students weigh privacy, safety, and convenience trade-offs in multiple data collection scenarios, including AI-driven methods. • 5.4 - Students examine privacy, safety, and convenience trade-offs by analyzing privacy policies, stakeholder perspectives, and AI-related data rights issues.
9-12.CS.3.7 Understand and define artificial intelligence.	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 3.5, 3.6, 3.7, 3.9, 3.11, 3.12, 3.13	

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
9-12.CS.5.23 Critically examine algorithms and design an original algorithm (adapt, remix, improve).	2.3, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13	2.3 - Students design original algorithms for given scenarios

Information Computer Tech

Essential Standards Standards are to be explicitly taught, assessed more than once, and intervened upon in this cluster of standards.	Unit/lesson(s)	Justification/Rationale
9-12.ICT.2.1 Develop and manage their digital identity and understand the permanence of their digital actions including the effect on current and future reputation.	6.1, 6.3, 6.4, 6.5	
9-12.ICT.2.3 Demonstrate an understanding of the rights and obligations of using and sharing intellectual property.	1.11, 6.7	• 1.11 - Directly addresses rights and obligations for using and sharing intellectual property

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
9-12.ICT.2.4 Maintain their digital security and understand data collection technology used to track their online activity.	3.10, 3.12, 4.2, 4.3, 4.4, 4.5, 4.6, 4.8, 4.9, 5.3, 5.4, 6.3, 6.4, 6.5	• 5.3 - Students directly examine privacy, consent, fairness, and bias in data collection, including ethical trade-offs, potential misuse, and transparency concerns
9-12.CS.3.1 Demonstrate responsible digital citizenship (legal and ethical behaviors) in the use of technology systems and software.	1.2, 1.4, 1.5, 1.6, 1.7, 1.11, 1.12, 6.1, 6.4, 6.5	• 1.4 - Students evaluate AI reliability, identify risks, and justify human oversight, reinforcing ethical and responsible technology use. • 1.6 - Students identify AI bias, evaluate fairness, and apply strategies for ethical, responsible technology use. • 1.7 - Students evaluate AI misinformation, analyze harms, and apply ethical strategies to reduce risks. • 1.11 - Students analyze ownership, attribution, and compensation issues in AI-generated content, weighing ethical tradeoffs and societal impacts of these practices. • 1.12 - students investigate community AI use, assess who benefits or is harmed (including environmental impacts), and propose equitable, responsible solutions.
9-12.ICT.2.2 Engage in positive, safe, legal and ethical behavior when using technology.	1.2, 1.4, 1.5, 1.6, 1.7, 1.10, 1.11, 1.12, 2.10, 3.12, 3.13, 4.2, 4.3, 4.5, 5.3, 5.5, 6.1, 6.2, 6.4, 6.5	• 1.6 - Students examine AI bias, evaluate fairness, and identify strategies for safe, ethical technology use • 1.7 - Students evaluate AI-generated content for accuracy, assess risks, and apply ethical strategies for safe technology use • 1.10 - Students evaluate AI's role in creative work, apply human judgment, and reflect on ethical, responsible collaboration with technology

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
		• 1.11 - Students evaluate ethical tradeoffs in AI collaboration, addressing fairness, attribution, copyright, and responsible technology use • 1.12 - Students investigate AI's community impacts, assess ethical and environmental concerns, and propose responsible solutions • 2.10 - Students debug real-world algorithms, examine bias and fairness, and evaluate ethical trade-offs in decision-making systems • 3.12 - Students evaluate real-world AI scenarios from multiple stakeholder perspectives and develop ethical guidelines for responsible technology use • 3.13 - Students design and prototype an AI-powered computer system addressing a UN SDG • 4.2 - Students analyze real privacy policies from websites and apps, identify types of personally identifiable information collected, and explain how disparate data points can be combined to identify individuals • 4.3 - Students assess privacy risks, evaluate benefits versus harms, and form informed opinions on privacy, security, and innovation tradeoffs • 4.5 - Students investigate phishing, keylogging, and malware, identify warning signs, and explain how these risks target people • 5.3 - Students explore multiple data collection methods and evaluate privacy, consent, fairness, and bias to address ethical implications

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
		• 5.5 - Students explore multiple data collection methods and evaluate privacy, consent, fairness, and bias to address ethical implications
ODC.9-10.5. Manage personal data to maintain digital privacy and security and be conscious and aware of data-collection technology used to track and exploit navigation online.	3.10, 4.2, 5.3, 5.4, 6.2, 6.3, 6.4, 6.5	• 3.10 - Students examine IoT data collection, identify and assess privacy/security risks, and analyze how devices gather and transmit personal data • 4.2 - Students examine types of personal data collected, analyze privacy policies, and consider strategies for controlling and protecting their information • 5.3 - Fully addresses managing personal data, maintaining privacy/security, and evaluating technology used to collect it, with explicit focus on ethical implications. • 5.4 - Students examine personal data protections, evaluate privacy policies, and consider implications of data-collection technologies from multiple stakeholder perspectives • 6.4 - Explicitly teaches that online activities contribute to a digital footprint, along with an analysis of the real world consequences and strategies for managing a digital footprint
ODC.11-12.5. Demonstrate the responsible and ethical use of information and communication technologies by distinguishing between kinds of information that should and should not be publicly shared and describing the consequences of a poor decision.	1.2, 3.10, 4.2, 4.3, 4.6, 4.9, 5.3, 5.4, 6.4, 6.5	• 3.10 - Students analyze IoT privacy risks, data ownership, and security concerns while considering what information devices collect, transmit, and whether it should be shared • 4.2 - Students identify private vs. public information, analyze privacy policies, and examine consequences of sharing personal data

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
		● 4.3 - Students evaluate privacy risks, distinguish what information should remain private, and analyze consequences of sharing data in technology tradeoffs ● 4.6 - Students examine a real-world breach to identify private data types, discuss why they should be protected, and consider consequences of poor data handling and sharing ● 4.9 - Students learn multifactor authentication and software update practices, explicitly connecting them to keeping private information secure and evaluating long-term privacy impacts ● 5.3 - Students distinguish between appropriate and inappropriate types of data to collect, weigh privacy/consent/fairness trade-offs, and discuss consequences of poor or unethical collection decisions through scenarios, discussions, and ethical guidelines creation. ● 5.4 - Students analyze privacy policy statements, distinguish between acceptable and unacceptable data practices, and discuss potential consequences of weak protections or misuse of personal data ● 6.5 - Students identify personal data collected through online tracking, decide what should remain private, and evaluate consequences of companies using or misusing that data

Digital Communications

Essential Standards Standards are to be explicitly taught, assessed more than once, and intervened upon in this cluster of standards.	Unit/lesson(s)	Justification/Rationale
ODC.9-12.6. Integrate multiple sources of information presented in diverse digital media, evaluating the credibility and accuracy of each source.	1.5, 1.7, 1.12, 1.13, 4.1, 5.3, 5.6, 6.2, 6.4, 6.5, 6.6	• 5.3 – Students analyze scenarios, datasets, and AI examples from multiple sources and formats, evaluate potential bias and ethical concerns, and synthesize findings into data collection guidance.

Supporting Standards Standards that support the Essential Standards. These standards will be taught but may or may not be formally assessed.	Unit/lesson(s)	Justification/Rationale
ODC.9-12.8. Make strategic use of digital media presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	1.13, 3.13, 4.5, 4.10	• 4.5 - Students create PSA slides that use visual design to clearly explain security risks, illustrate key warnings, and make the message engaging for peer learning.

For Questions Contact

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