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Standards

INTRODUCTION

The ISTE Standards serve as a framework for innovation and excellence in learning, teaching and leading. As a body of work, the suite of standards has guided educator practice, school improvement planning, professional growth and advances in curriculum. The ISTE Standards have been updated as learning have evolved, and now the ISTE Standards will be considered a single work comprising of four sections: Students, Educators, Educational Leaders and Coaches. As a compilation, the ISTE Standards provide a holistic and comprehensive guide to transforming systems in order to transform the lives of our students.

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SECTION 1: STUDENTS

1.1. Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

1.1.a. 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.b. build networks and customize their learning environments in ways that support the learning process.

1.1.c. use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

1.1.d. understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

1.2. Digital Citizen

Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students:

1.2.a. cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

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

1.2.c. demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

1.2.d. manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

1.3. Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

1.3.a. plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

1.3.b. evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

1.3.c. curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

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

1.4. Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

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

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

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

1.4.d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

1.5. Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

1.5.a. formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

1.5.b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

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

1.5.d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

1.6. Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

1.6.a. choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

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

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

1.6.d. publish or present content that customizes the message and medium for their intended audiences.

1.7. Global Collaborator

Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students:

1.7.a. use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

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

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

1.7.d. explore local and global issues and use collaborative technologies to work with others to investigate solutions.

SECTION 2: EDUCATORS

Empowered Professional

2.1. Learner

Teachers continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Teachers:

2.1.a. Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.

2.1.b. Pursue professional interests by creating and actively participating in local and global learning networks.

2.1.c. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.

2.2. Leader

Teachers seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Teachers:

2.2.a. Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.

2.2.b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.

2.2.c. Model for colleagues the identification, experimentation, evaluation, curation and adoption of new digital resources and tools for learning.

2.3. Citizen

Teachers inspire students to positively contribute and responsibly participate in the digital world. Teachers:

2.3.a. Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.

2.3.b. Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.

2.3.c. Mentor students in the safe, ethical and legal practice with digital tools and protection of intellectual rights and property.

2.3.d. Model and promote management of personal data and digital identity and protect student data privacy.

Learning Catalyst

2.4. Collaborator

Teachers dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Teachers:

2.4.a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.

2.4.b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.

2.4.c. Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.

2.4.d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.

2.5. Designer

Teachers design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Teachers:

2.5.a. Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs.

2.5.b. Design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning.

2.5.c. Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.

2.6. Facilitator

Teachers facilitate learning with technology to support student achievement of the 2016 ISTE Standards for Students. Teachers:

2.6.a. Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings.

2.6.b. Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.

2.6.c. Create learning opportunities that challenge students to use a design process and/or computational thinking to innovate and solve problems.

2.6.d. Model and nurture creativity and creative expression to communicate ideas, knowledge or connections.

2.7. Analyst

Teachers understand and use data to drive their instruction and support students in achieving their learning goals. Teachers:

2.7.a. Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.

2.7.b. Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.

2.7.c. Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.

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SECTION 3: EDUCATION LEADERS

3.1. Equity and Citizenship Advocate

Leaders use technology to increase equity, inclusion, and digital citizenship practices. Education leaders:

3.1.a. Ensure all students have skilled teachers who actively use technology to meet student learning needs.

3.1.b. Ensure all students have access to the technology and connectivity necessary to participate in authentic and engaging learning opportunities.

3.1.c. Model digital citizenship by critically evaluating online resources, engaging in civil discourse online and using digital tools to contribute to positive social change.

3.1.d. Cultivate responsible online behavior, including the safe, ethical and legal use of technology.

3.3. Empowering Leader

Leaders create a culture where teachers and learners are empowered to use technology in innovative ways to enrich teaching and learning. Education leaders:

3.3.a. Empower educators to exercise professional agency, build teacher leadership skills and pursue personalized professional learning.

3.3.b. Build the confidence and competency of educators to put the ISTE Standards for Students and Educators into practice.

3.3.c. Inspire a culture of innovation and collaboration that allows the time and space to explore and experiment with digital tools.

3.3.d. Support educators in using technology to advance learning that meets the diverse learning, cultural, and social-emotional needs of individual students.

3.3.e. Develop learning assessments that provide a personalized, actionable view of student progress in real time.

3.2. Visionary Planner

Leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology. Education leaders:

3.2.a. Engage education stakeholders in developing and adopting a shared vision for using technology to improve student success, informed by the learning sciences.

3.2.b. Build on the shared vision by collaboratively creating a strategic plan that articulates how technology will be used to enhance learning.

3.2.c. Evaluate progress on the strategic plan, make course corrections, measure impact and scale effective approaches for using technology to transform learning.

3.2.d. Communicate effectively with stakeholders to gather input on the plan, celebrate successes and engage in a continuous improvement cycle.

3.2.e. Share lessons learned, best practices, challenges and the impact of learning with technology with other education leaders who want to learn from this work.

3.4. Systems Designer

Leaders build teams and systems to implement, sustain and continually improve the use of technology to support learning. Education leaders:

3.4.a. Lead teams to collaboratively establish robust infrastructure and systems needed to implement the strategic plan.

3.4.b. Ensure that resources for supporting the effective use of technology for learning are sufficient and scalable to meet future demand.

3.4.c. Protect privacy and security by ensuring that students and staff observe effective privacy and data management policies.

3.4.d. Establish partnerships that support the strategic vision, achieve learning priorities and improve operations.

3.5. Connected Learner

Leaders model and promote continuous professional learning for themselves and others. Education leaders:

3.5.a. Set goals to remain current on emerging technologies for learning, innovations in pedagogy and advancements in the learning sciences.

3.5.b. Participate regularly in online professional learning networks to collaboratively learn with and mentor other professionals.

3.5.c. Use technology to regularly engage in reflective practices that support personal and professional growth.

3.5.d. Develop the skills needed to lead and navigate change, advance systems and promote a mindset of continuous improvement for how technology can improve learning.

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SECTION 4: COACHES

4.1. Change Agent

Coaches inspire educators and leaders to use technology to create equitable and ongoing access to high-quality learning. Coaches:

4.1.a. Create a shared vision and culture for using technology to learn and accelerate transformation through the coaching process.

4.1.b. Facilitate equitable use of digital learning tools and content that meet the needs of each learner.

4.1.c. Cultivate a supportive coaching culture that encourages educators and leaders to achieve a shared vision and individual goals.

4.1.d. Recognize educators across the organization who use technology effectively to enable high-impact teaching and learning.

4.1.e. Connect leaders, educators, instructional support, technical support, domain experts and solution providers to maximize the potential of technology for learning.
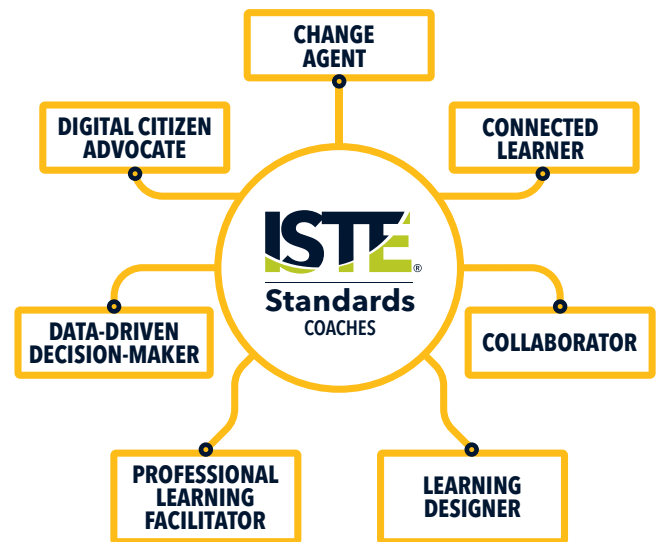
4.3. Collaborator

Coaches establish productive relationships with educators in order to improve instructional practice and learning outcomes. Coaches:

4.3.a. Establish trusting and respectful coaching relationships that encourage educators to explore new instructional strategies.

4.3.b. Partner with educators to identify digital learning content that is culturally relevant, developmentally appropriate and aligned to content standards.

4.3.c. Partner with educators to evaluate the efficacy of digital learning content and tools to inform procurement decisions and adoption.

4.3.d. Personalize support for educators by planning and modeling the effective use of technology to improve student learning.

4.2. Connected Learner

Coaches model the ISTE Standards for Students and the ISTE Standards for Educators and identify ways to improve their coaching practice. Coaches:

4.2.a. Pursue professional learning that deepens expertise in the ISTE Standards in order to serve as a model for educators and leaders.

4.2.b. Actively participate in professional learning networks to enhance coaching practice and keep current with emerging technology and innovations in pedagogy and the learning sciences.

4.2.c. Establish shared goals with educators, reflect on successes and continually improve coaching and teaching practice.

4.4. Learning Designer

Coaches model and support educators to design learning experiences and environments to meet the needs and interests of all students. Coaches:

4.4.a. Collaborate with educators to develop authentic, active learning experiences that foster student agency, deepen content mastery and allow students to demonstrate their competency.

4.4.b. Help educators use digital tools to create effective assessments that provide timely feedback and support personalized learning.

4.4.c. Collaborate with educators to design accessible and active digital learning environments that accommodate learner variability.

4.4.d. Model the use of instructional design principles with educators to create effective digital learning environments.

4.5. Professional Learning Facilitator

Coaches plan, provide and evaluate the impact of professional learning for educators and leaders to use technology to advance teaching and learning. Coaches:

4.5.a. Design professional learning based on needs assessments and frameworks for working with adults to support their cultural, social-emotional and learning needs.

4.5.b. Build the capacity of educators, leaders and instructional teams to put the ISTE Standards into practice by facilitating active learning and providing meaningful feedback.

4.5.c. Evaluate impact of professional learning and continually make improvements in order to meet schoolwide vision for using technology for high-impact teaching and learning.

4.6. Data-Driven Decision-Maker

Coaches model and support the use of qualitative and quantitative data to inform their own instruction and professional learning. Coaches:

4.6.a. Assist educators and leaders in securely collecting and analyzing student data.

4.6.b. Support educators to interpret qualitative and quantitative data to inform their decisions and support individual student learning.

4.6.c. Partner with educators to empower students to use learning data to set their own goals and measure their progress.

4.7. Digital Citizen Advocate

Coaches model digital citizenship and support educators and students in recognizing the responsibilities and opportunities inherent in living in a digital world. Coaches:

4.7.a. Inspire and encourage educators and students to use technology for civic engagement and to address challenges to improve their communities.

4.7.b. Partner with educators, leaders, students and families to foster a culture of respectful online interactions and a healthy balance in their use of technology.

4.7.c. Support educators and students to critically examine the sources of online media and identify underlying assumptions.

4.7.d. Empower educators, leaders and students to make informed decisions to protect their personal data and curate the digital profile they intend to reflect.

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COMPUTATIONAL THINKING COMPETENCIES FOR EDUCATORS

Leaders and educators around the world have the enormous responsibility of preparing all students for success in a future where computing power underpins every aspect of the systems we encounter in our daily lives. Ensuring that every student understands and is able to harness the power of computing to improve their success in their personal, academic or professional lives is an ambitious goal. The **ISTE Standards: Computational Thinking Competencies for Educators** is intended to help all educators contribute to making that goal a reality.

Similarly to how technology is used by educators to deepen content area learning while building digital learning skills, teachers can integrate CT practices in their instruction to introduce computational ideas. This will enhance student content knowledge and build confidence and competence

in CT. By integrating computational thinking into the classroom, educators can support students to develop problem-solving and critical-thinking skills, and empower them for success as CS learners and computational thinkers.

This document is not a one-size-fits-all list of expectations, but a recognition that competencies present different opportunities for growth and goal-setting for educators. Educators are doing powerful work to integrate CT across other disciplines to enable students to learn, use and apply CS concepts and CT practices across different contexts. ISTE seeks to help educators recognize where this work is already happening, identify opportunities to make these connections more explicit, and develop new ways to deepen student learning in CS, using computational thinking to drive that work.

5.1. Computational Thinking (Learner)

Educators continually improve their practice by developing an understanding of computational thinking and its application as a cross-curricular skill. Educators develop a working knowledge of core components of computational thinking: such as decomposition; gathering and analyzing data; abstraction; algorithm design; and how computing impacts people and society. Educators:

5.1.a. Set professional learning goals to explore and apply teaching strategies for integrating CT practices into learning activities in ways that enhance student learning of both the academic discipline and CS concepts.

5.1.b. Learn to recognize where and how computation can be used to enrich data or content to solve discipline-specific problems and be able to connect these opportunities to foundational CT practices and CS concepts.

5.1.c. Leverage CT and CS experts, resources and professional learning networks to continuously improve practice integrating CT across content areas.

5.1.d. Develop resilience and perseverance when approaching CS and CT learning experiences, build comfort with ambiguity and open-ended problems, and see failure as an opportunity to learn and innovate.

5.1.e. Recognize how computing and society interact to create opportunities, inequities, responsibilities and threats for individuals and organizations.

5.2. Equity Leader (Leader)

All students and educators have the ability to be computational thinkers and CS learners. Educators proactively counter stereotypes that exclude students from opportunities to excel in computing and foster an inclusive and diverse classroom culture that incorporates and values unique perspectives; builds student self-efficacy and confidence around computing; addresses varying needs and strengths; and addresses bias in interactions, design and development methods. Educators:

5.2.a. Nurture a confident, competent and positive identity around computing for every student.

5.2.b. Construct and implement culturally relevant learning activities that address a diverse range of ethical, social and cultural perspectives on computing and highlight computing achievements from diverse role models and teams.

5.2.c. Choose teaching approaches that help to foster an inclusive computing culture, avoid stereotype threat and equitably engage all students.

5.2.d. Assess and manage classroom culture to drive equitable student participation, address exclusionary dynamics and counter implicit bias.

5.2.e. Communicate with students, parents and leaders about the impacts of computing in our world and across diverse roles and professional life, and why these skills are essential for all students.

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5.3. Collaborating Around Computing (Collaborator)

Effective collaboration around computing requires educators to incorporate diverse perspectives and unique skills when developing student learning opportunities, and recognize that collaboration skills must be explicitly taught in order to lead to better outcomes than individuals working independently. Educators work together to select tools and design activities and environments that facilitate these collaborations and outcomes. Educators:

5.3.a. Model and learn with students how to formulate computational solutions to problems and how to give and receive actionable feedback.

5.3.b. Apply effective teaching strategies to support student collaboration around computing, including pair programming, working in varying team roles, equitable workload distribution and project management.

5.3.c. Plan collaboratively with other educators to create learning activities that cross disciplines to strengthen student understanding of CT and CS concepts and transfer application of knowledge in new contexts.

5.4. Creativity & Design (Designer)

Computational thinking skills can empower students to create computational artifacts that allow for personal expression. Educators recognize that design and creativity can encourage a growth mindset and work to create meaningful CS learning experiences and environments that inspire students to build their skills and confidence around computing in ways that reflect their interests and experiences. Educators:

5.4.a. Design CT activities where data can be obtained, analyzed and represented to support problem-solving and learning in other content areas.

5.4.b. Design authentic learning activities that ask students to leverage a design process to solve problems with awareness of technical and human constraints and defend their design choices.

5.4.c. Guide students on the importance of diverse perspectives and human-centered design in developing computational artifacts with broad accessibility and usability.

5.4.d. Create CS and CT learning environments that value and encourage varied viewpoints, student agency, creativity, engagement, joy and fun.

5.5. Integrating Computational Thinking (Facilitator)

Educators facilitate learning by integrating computational thinking practices into the classroom. Since computational thinking is a foundational skill, educators develop every student's ability to recognize opportunities to apply computational thinking in their environment. Educators:

5.5.a. Evaluate and use CS and CT curricula, resources and tools that account for learner variability to meet the needs of all students.

5.5.b. Empower students to select personally meaningful computational projects.

5.5.c. Use a variety of instructional approaches to help students frame problems in ways that can be represented as computational steps or algorithms to be performed by a computer.

5.5.d. Establish criteria for evaluating CT practices and content learning that use a variety of formative and alternative assessments to enable students to demonstrate their understanding of age-appropriate CS and CT vocabulary, practices and concepts.

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ADOPTING THE ISTE STANDARDS

The ISTE Standards are research-based and can meet local goals, needs and priorities. Adopting the standards in a school, district or state/province takes different forms. Leaders may decide to use the standards in a variety of ways, including:

- As part of statewide or district-level expectations.

- To guide systemwide planning, including school improvement and technology plans.

- To guide professional development plans and/or individual professional growth goals.

- To map curriculum.

- To ensure that lesson design and plans include purposeful use of technology.

- As part of a learning management system or web system.

- In teacher preparation across the curriculum.

- To embed in job descriptions and hiring decisions.

Access this report to support systemwide adoption of the ISTE Standards

Crompton, H., & Sykora, C. (2021). Developing instructional technology standards for educators: A design-based research study. Computers and Education Open 2 **https://doi.org/10.1016/j.caeo.2021.100044**

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