

CURRICULUM ALIGNMENT GUIDE

ISTE STANDARDS

FOR STUDENTS

100 Ideas for Secondary Teachers: Outstanding Computing Lessons

INTRODUCTION

100 ideas: Outstanding Computing Lessons is a collection of 100 practical, tried-and-tested ideas for teaching computing. It is aimed at computing / ICT teachers of all levels, whether specialist or non-specialist, newly qualified or experienced.



For more information on 100 Ideas: Outstanding Computing Lessons and to find additional education resources and supporting materials, including more than 50 free worksheets to accompany the activities in the book, visit: teachwithict.com/100ideas

10 sample activities can be downloaded for free at teachwithict.com/bonus

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:

STANDARD	DESCRIPTION	ACTIVITY
1a	articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.	<ul style="list-style-type: none">• Idea 32: Dragon's Den
1b	build networks and customize their learning environments in ways that support the learning process.	<ul style="list-style-type: none">• Idea 21: Blogs & wikis• Idea 71: Podcasts
1c	use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.	<ul style="list-style-type: none">• Idea 21: Blogs & wikis• Idea 71: Podcasts
1d	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.	<ul style="list-style-type: none">• Idea 12: Take your screwdrivers to work• Idea 37: Little Man Computer• Idea 38: Features of a CPU• Idea 40: The great input/output QR hunt• Idea 41: Moral machine

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:

STANDARD	DESCRIPTION	ACTIVITY
2a	cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.	<ul style="list-style-type: none">• Idea 25: Copycat• Idea 27: Fakebook• Idea 29: Did you meme it?• Idea 33: Wayback machine• Idea 34: What a waste
2b	engage in positive, safe, legal and ethical behavior when using technology,	<ul style="list-style-type: none">• Idea 25: Copycat• Idea 27: Fakebook• Idea 29: Did you meme it?

	including social interactions online or when using networked devices.	<ul style="list-style-type: none"> Idea 33: Wayback machine
2c	demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.	<ul style="list-style-type: none"> Idea 25: Copycat
2d	manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.	<ul style="list-style-type: none"> Idea 27: Fakebook

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:

STANDARD	DESCRIPTION	ACTIVITY
3a	plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.	<ul style="list-style-type: none"> Idea 35: Role reversal Idea 36: Storage Top Trumps®
3b	evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.	<ul style="list-style-type: none"> Idea 23: Fake news
3c	curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.	<ul style="list-style-type: none"> Idea 21: Blogs & wikis Idea 30: Videography Idea 31: Infographics Idea 69: Padlet Idea 71: Podcasts Idea 74: Sketch noting Idea 77: TweetIT
3d	build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions	<ul style="list-style-type: none"> Idea 14: Contextualizing learning Idea 32: Dragon's Den Idea 34: What a waste Idea 106: Data science detectives

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:

STANDARD	DESCRIPTION	ACTIVITY
4a	know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.	<ul style="list-style-type: none">• Idea 32: Dragon's Den• Idea 34: What a waste• Idea 39: Internet of Things (IoT)
4b	select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.	<ul style="list-style-type: none">• Idea 32: Dragon's Den• Idea 34: What a waste
4c	develop, test and refine prototypes as part of a cyclical design process.	<ul style="list-style-type: none">• Idea 32: Dragon's Den• Idea 34: What a waste• Idea 96: Physical computing
4d	exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.	<ul style="list-style-type: none">• Idea 32: Dragon's Den• Idea 34: What a waste

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:

STANDARD	DESCRIPTION	ACTIVITY
5a	formulate problem definitions suited for technology assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.	<ul style="list-style-type: none">• Idea 106: Data science detectives• Idea 98: Coding the weather
5b	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.	<ul style="list-style-type: none">• Idea 26: Mario Kart™ spreadsheets• Idea 28: Database detectives• Idea 31: Infographics• Idea 39: Internet of things• Idea 98: Coding the weather• Idea 106: Data science detectives• Idea 108: Make me happy (AI sentiment analysis)

5c	break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.	<ul style="list-style-type: none"> • Idea 42: Making the tea algorithm • Idea 43: Teaching with magic • Idea 44: Crazy characters • Idea 45: Puzzle me • Idea 46: Human robot • Idea 47: A-maze-ing algorithms • Idea 49: Breaking the code • Idea 50: Origami algorithms • Idea 51: Guess the object • Idea 106: Data science detectives
5d	understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.	<ul style="list-style-type: none"> • Idea 96: Physical computing

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:

STANDARD	DESCRIPTION	ACTIVITY
6a	choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	<ul style="list-style-type: none"> • Idea 32: Dragon's Den • Idea 34: What a waste • Idea 35: Role reversal
6b	create original works or responsibly repurpose or remix digital resources into new creations.	<ul style="list-style-type: none"> • Idea 25: Copycat • Idea 100: Color splash
6c	communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.	<ul style="list-style-type: none"> • Idea 30: Videography • Idea 31: Infographics
6d	publish or present content that customizes the message and medium for their intended audiences	<ul style="list-style-type: none"> • Idea 31: Infographics • Idea 32: Dragon's Den

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:

STANDARD	DESCRIPTION	ACTIVITY
7a	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.	<ul style="list-style-type: none">• Idea 48: 20 questions (Mystery Skype)
7b	use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.	<ul style="list-style-type: none">• Idea 17: Peer instruction• Idea 32: Dragon's Den• Idea 34: What a waste
7c	contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.	<ul style="list-style-type: none">• Idea 32: Dragon's Den• Idea 34: What a waste
7d	explore local and global issues and use collaborative technologies to work with others to investigate solutions.	<ul style="list-style-type: none">• Idea 34: What a waste

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