مـــدرستـنـا الـثـانـويـة الإنجـلـيـزيـة، الشـارقـة
OUR OWN ENGLISH HIGH SCHOOL, SHARJAH
A GEMS SCHOOL

GEMS EDUCATION

Primary Curriculum

Computer Science

Grades 1 to 5

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1. Introduction

The Computer Science and Technology Standards fall into four broad categories/domains.

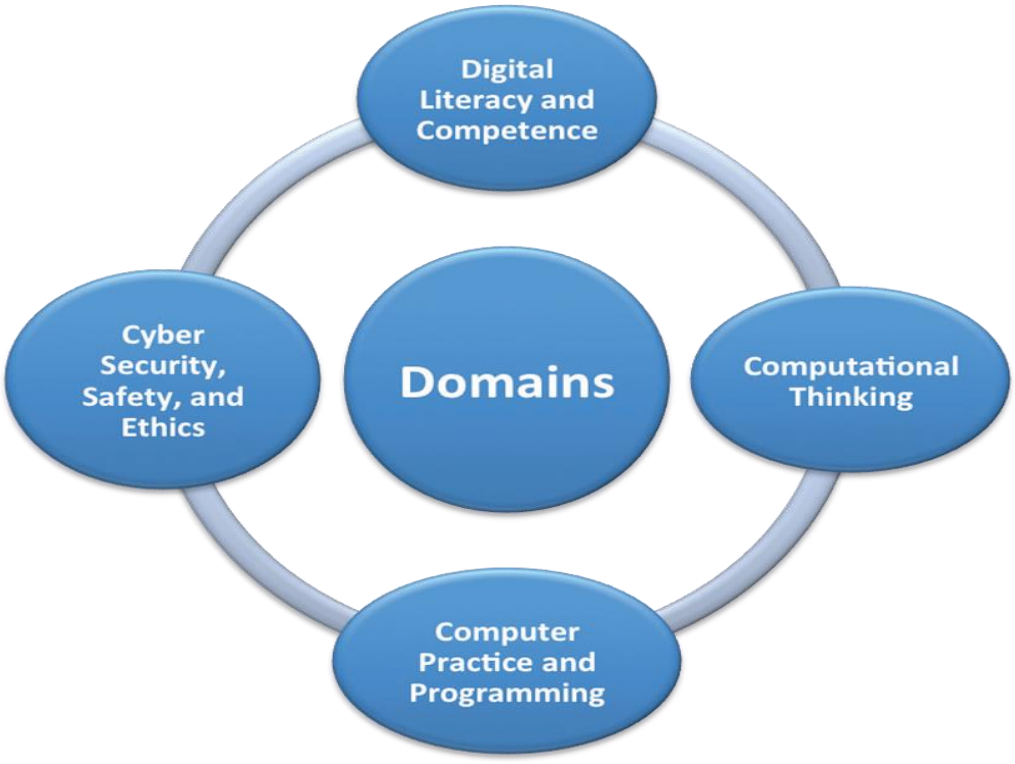
Domains:

1. **Digital Literacy and Competence**: Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, operation, and connectivity, communication, productivity, and collaboration.

2. **Computational Thinking**: Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, data representation, creativity, and innovation that is vital in the 21st century. Computational thinking also consists of some very specific problem solving skills such as the ability to think logically, algorithmically and recursively.

3. **Computer Practice and Programming**: Demonstrate the ability to write computer code for problem solving, accomplish certain tasks, and decision making, and have the opportunity to progress to the next level of excellence in these activities.

4. **Cyber Security, Safety, and Ethics:** Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.



2.Domains and Generic Outcomes

The Computer Science and Technology Standards have identified the following major domains and strands as the backbone for the new curriculum and related activities. All activities in this curriculum are linked with **SDG goals**.

Digital Literacy and Competence (DLC)

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students will:

a) understand and use technology systems.
b) apply digital tools, media, and environment to gather, evaluate, use, communicate and work collaboratively.
c) evaluate, select, and use information sources and digital tools based on the appropriateness to specific tasks effectively and productively.
d) process data and report results.
e) interact, collaborate, and publish with peers or project teams.
f) communicate information and ideas effectively using a variety of media and formats.
g) troubleshoot systems and applications.
h) transfer current knowledge to learning of new technologies.

Critical thinking (CT)

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students will:

a) identify and define authentic problems and significant questions for investigation.
b) plan and manage activities to develop a solution or complete a project.
c) collect and analyze data to identify solutions and/or make informed decisions.
d) use multiple processes and diverse perspectives to explore alternative solutions.
e) apply existing knowledge to generate new ideas, products, or processes.
f) identify trends and forecast possibilities.
g) demonstrate creative thinking, construct knowledge, and develop innovative products.
h) use predefined methods to divide a complex problem into simpler parts.
i) explain how sequence, selection, iteration, and recursion are building blocks of algorithms.
j) discuss the value of abstraction to manage problem complexity.

Computer Practice and Programming (CPP)

Students understand, analyze, write, test, and document computer programs that model behavior and theories. Students will:

a) describe a software development process used to solve problems (e.g., design, coding, testing, verification).
b) use appropriate software tools and libraries to help solve algorithmic and computational problems.
c) understand the broad array of programming languages and tools across other fields and disciplines.
d) design, develop, publish, and present products (e.g., webpages, mobile applications, animations) using technology resources.

e) demonstrate an understanding of algorithms and their practical application.
f) implement problem solutions using a programming language, including: looping behavior, conditional statements, logic, expressions, variables, and functions.
g) collect and analyze data that is output from multiple runs of a computer program.

Cyber Security, Safety, and Ethics (CCC)

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students will:

a) advocate and practice safe, legal, and responsible use of information and technology.
b) exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
c) demonstrate personal responsibility for lifelong learning.
d) exhibit leadership for digital citizenship.
e) locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
f) develop cultural understanding and global awareness by engaging with learners of other cultures.
g) demonstrate good practices in personal information security, using passwords, encryption, and secure transactions.

3.Standards Development Methodology

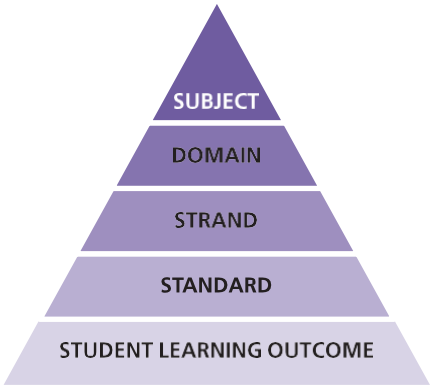
The process by which these standards were developed began with agreement that high - quality teaching and learning standards systematically organize content in a given subject area.

Table 1: Computer Science and Technology Domains and Associated strands

DLC	CT	CPP	CCC
• Computer Operation • Productivity Tools • Internet surfing and information retrieval • Collaboration tools • Computer Networking.	• Algorithmic thinking • Evaluation • Decomposition • Abstraction • Generalization	• Programming Evolution • Human Computer Interaction (HCI) • Data Representation • Coding • Testing and Validation • Documentation and Deployment	• Responsible Use & Cyber - Security • Impacts of Technology • Information accuracy & reliability • Cyber Ethics & Laws • Cyber Safety

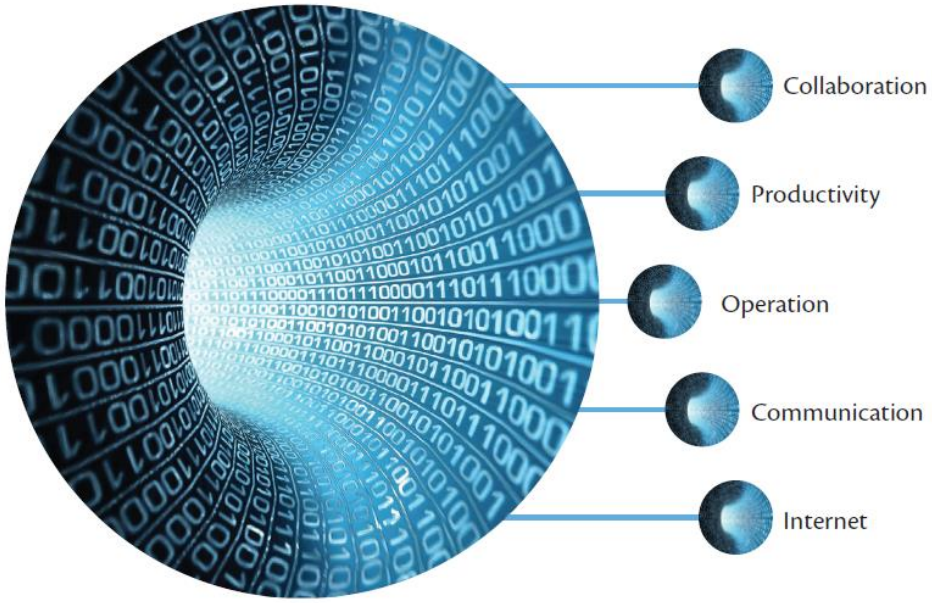
The development of the document followed the below structure and as depicted in the hierarchical figure shown below (See Fig. 3).

Subject is the curriculum area of interest and the first level of analysis in the structure of standards.
Domains are the major elements of a subject. In the UAE, CST has four domains (see Table 1). Domains run through the entire K - 12 system.
Strands are the key topics that domains consist of. All of the strands for each domain are shown in Table 1. In CST, strands cover a number of grades but rarely run through the entire K - 12 system.
Standards are the broad target objectives within each strand and are grade specific.
Student learning outcomes (SLOs) are the lowest level of analysis in the structure of standards. SLOs are the grade - specific expected learning outcomes, which may take one to three classes to achieve. These are what teachers should target their instruction toward. Lesson plans should be aligned with SLOs—as should all instructional resources—and test items. The SLOs provided here may need further fine tuning when used for lesson planning, materials design, and other pedagogical activities.



Key Content areas per Domain

Domain 1 : Digital Literacy and Competence (DLC)



Definition

Digital Literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.
There are eight essential elements of digital literacy. These elements are cultural, cognitive, constructive, communicative, confidence, creative, critical and civic. The cultural element requires the ability to use technology in different contexts. Whereas, the cognitive component enables mastery of technological tools, software, and platforms. Also, one of the most important elements of digital literacy is the ability to reuse, remix existing resources to create and share new data digitally with others depending on emerging needs, while using different communication devices with proficiency to communicate.
Gaining competence with digital technologies will create confidence and suitable environment to support self - learning. Students/learners will be part of online communities where they can share knowledge and content. Furthermore, It is providing a place for creativity where learners become able to create new products using their searching and constructing skills. and use their critical skills to develop various perspectives and take different circumstances into account.

The strands to be covered are:

- Computer Operation
- Productivity Tools
- Internet Surfing and Information Retrieval
- Collaboration Tools
- Computer Networking

Generic Outcomes

G1 - G5 (cycle 1)

At the end of cycle one, the students will be able to identify the basic components of a personal computer. They will safely and correctly perform basic operations involving a personal computer. They will launch and use specified software to create and edit word document, presentation and spreadsheet and introduce basic keyboarding skills.

Strands Description and Technical Keywords

	Strand Title	Strand Description	Key words
1	Computer Operation	In this strand, students will develop their Knowledge, skills and behaviors to utilize computers and related technology efficiently. They will use a range of skills covering different levels from basic to advance on how computers work and operate. They will be able to solve common hardware and software problems.	Computer hardware - computer software - computer uses - Computer organization - Input and output devices - Storage devices - operating systems.
2	Productivity Tools	In this strand, students will understand and use different productivity tools. During G1 -G5 students will explore and use the most common productivity software application used in business, education and home. They will learn how to create word processing documents, spreadsheets, databases and multimedia products.	Microsoft Paint - Microsoft Word - Microsoft PowerPoint - Microsoft Excel

3	Internet Surfing and Information Retrieval	In this strand, students will know how to connect to the Inernet, browse different websites and customize browsers. They will be able to control their privacy and security while serving the net. They will be introduced to different search options and strategies to find appropriate information to suit the requested task. They will be able to make informed choices of search sites, search tools, precise keywords that yield the best results and reliable resources.	Internet Components - different types of Internet connections - search engine
4	Collaboration Tools-Gr5	In this strand, students will examine new technologies, devices, online tools and strategies to communicate effectively over a network. They will use Inernet and online resources to collaboratively select and interact together while working on school tasks or projects.	- online web tools

Strands Evolution Per Grade

Domain	Strand	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Digital literacy and competence	Computer Operation	• Understand the pervasiveness of computers and computing in daily life • Develop understanding of major windows desktop components • Expand student's typing ability and promote the correct keyboarding position	• Identify the function of computer hardware components • Utilize basic OS user interface elements • Expand student's typing ability and promote the correct keyboarding position	• Identify types of computers, how they process information and how individual computers interact with other computing systems and device • Utilize Intermediate OS user interface elements • Expand student's typing ability and promote the correct keyboarding position	• Identify the function of computer hardware components • Manipulate and control the windows desktop files and disks • Expand student's typing ability and promote the correct keyboarding position	• Identify the function of computer hardware components • Use various operating system features • Expand student's typing ability and promote the correct keyboarding position
	Productivity Tools	• Demonstrate the ability to use tools in drawing programs to communicate and exchange ideas	• Demonstrate the ability to use tools in drawing programs to communicate and exchange ideas	• Demonstrate the ability to use tools in word processing programs to communicate and exchange ideas • Use a presentation tools to communicate and exchange ideas	• Demonstrate the ability to use tools in word processing programs to communicate and exchange ideas • Use a presentation tools to communicate and exchange ideas • Use a media tools to communicate among classes or groups within a class	• Demonstrate the ability to use tools in word processing programs to communicate and exchange ideas • Use a presentation tools to communicate among classes or groups within a class • Demonstrate the ability to use tools in spreadsheet programs to communicate and exchange ideas

	Internet Surfing and Information Retrieval	• Access and use the World Wide Web to browse a specific website	• Access and use the World Wide Web to browse a website	• Student should be able to use various web browser features • Use the search engine to locate information • Use the search engine to locate information	• Student should be able to use various web browser features • Use technologies to locate, collect and organize information	• Understanding the meaning of network and their features. • Perform basic searches to locate information, using techniques to refine and limit such searches
	Collaboration Tools					• Communicate with other using appropriate technology including email. • Communicate and collaborate with others using social network

Integration between DLC domain and other domains

DLC	CCC	CT	CPP
Computer Operation	• Responsible Use & Cyber - Security • Impacts of Technology • Digital Safety	• Generalization	• Programming Evolution
Productivity Tools	• Responsible Use & Cyber - Security • Impacts of Technology • Digital Safety • Cyber Ethics & Laws	• Decomposition • Abstraction • Evaluation	• Deployment and Documentation
Internet Surfing and Information Retrieval	• Responsible Use & Cyber - Security • Digital Safety • Cyber Ethics & Laws • Information accuracy & reliability	• Evaluation • Decomposition • Abstraction	
Collaboration Tools	• Responsible Use & Cyber - Security • Impacts of Technology • Information accuracy & reliability • Cyber Ethics & Laws • Digital Safety	• Generalization	• Data Representation

Scope and Sequence
Domains, Strands and Standards by Grade

GRADE 1				
Domain	Strand	Standards	Learning outcomes	Integration
	(1.1) Computer Operation	(1.1.2) Develop understanding of major windows desktop components	(G1.1.1.2.1) Demonstrate starting, rebooting, and shutting down a computer	
			(G1.1.1.2.2) Identify elements of windows desktop	
			(G1.1.1.2.3) Manipulate windows using basic functions	
		(1.1.3) Understand the pervasiveness of computers and computing in daily life	(G1.1.1.3.1) Describe the importance of computers in today's world	
			(G1.1.1.3.2) Identify the main parts of a computer	
			(G1.1.1.3.3) List different type of computer based on size, use and application	
		(1.1.4) Expand student's typing ability and promote the correct keyboarding position	(G1.1.1.4.1) Classify types of basic keys on the keyboard	
			(G1.1.1.4.2) Apply basic keyboarding techniques	Typing of sentences in MS-Word/Powerpoint(Linked to English and Science)
	(1.2) Productivity Tools	(1.2.1) Demonstrate the ability to use tools in drawing programs to communicate and exchange ideas	(G1.1.2.1.1) Draw a picture using different tools or software	MS-Paint/Tux Paint-To draw a scenery (Life on Land-sdg goal)
			(G1.1.2.1.2) Manipulate text using basic formatting tools	Typing of sentences in MS-Word/Powerpoint using different font colours and underline tool(Linked to English and Science)
	(1.3) Internet Surfing and Information Retrieval	(1.3.1) Access and use the World Wide Web to browse a specific website	(G1.1.3.1.1) Define Internet.	
			(G1.1.3.1.2) Open specific web site	

GRADE 2				
Domain	Strand	Standards	Learning outcomes	Integration
	(1.1) Computer Operation	(1.1.4) Expand student's typing ability and promote the correct keyboarding position	(G2.1.1.4.1) Classify types of advance keys on the keyboard	
			(G2.1.1.4.2) Apply intermediate keyboarding techniques	Creative writing in Ms-Word / Powerpoint **(Linked to English)**
		(1.1.5) Identify the function of computer hardware components	(G2.1.1.5.1) Identify the input and output devices	
		(1.1.6) Utilize basic OS user interface elements	(G2.1.1.6.1) Use the OS start menu and taskbar	
	(1.2) Productivity Tools	(1.2.1) Demonstrate the ability to use tools in drawing programs to communicate and exchange ideas	(G2.1.2.1.1) Identify the menus in paint software	
			(G2.1.2.1.2) Draw a picture Using advanced tools	Draw a scenery in Ms-Paint for the SDG Goal 15 **(Linked to SDG, ECO and Science)**
	(1.3) Internet Surfing and Information Retrieval	(1.3.1) Access and use the World Wide Web to browse a website	(G2.1.3.1.1) List components required for an Internet connection	
			(G2.1.3.1.2) Identify the purpose of a browser in accessing information on the World Wide Web	
			(G2.1.3.1.3) Navigate different web site using basic functions	Make an information card on the SDG Goal-13 **(Linked to SDG, English & Science)**

GRADE 3				
Domain	Strand	Standards	Learning outcomes	Integration
	(1.1) Computer Operation	(1.1.4) Expand student's typing ability and promote the correct keyboarding position	(G3.1.1.4.1) Students keyboard using correct hand, movement, arm, and body position	Students will type in any document on the topic – Importance of Good health and Wellbeing- **Linked to SDG Goals**
			(G3.1.1.4.2) Promote accuracy and speed of typing	
		(1.1.7) Utilize Intermediate OS user interface elements	(G3.1.1.7.1) Manipulate desktop folders and icons	

1. Digital literacy and competence		(1.1.8) Identify types of computers, how they process information and how individual computers interact with other computing systems and device	(G3.1.1.8.1) Identify main processing components of a computer	
			(G3.1.1.8.2) Describe the flow of information between storage devices to the microprocessor and RAM in relation to everyday computer operations	
	(1.2) Productivity Tools	(1.2.1) Demonstrate the ability to use tools in word processing programs to communicate and exchange ideas	(G3.1.2.1.1) Create a new word processing document	
			(G3.1.2.1.2) Use menu, tool bar functions in a word processing program	Create a document on the SDG -15 **Linked to SDG Goals, Science**
		(1.2.5) Use a presentation tools to communicate and exchange ideas	(G3.1.2.5.1) Create a simple presentation	Create a Presentation on SDG 2 – **Linked with SDG and Science**
	(1.3) Internet Surfing and Information Retrieval	(1.3.2) Student should be able to use various web browser features	(G3.1.3.2.1) Identify terminology related to the Internet	
			(G3.1.3.2.2) Navigate different web site using intermediate functions	
		(1.3.3) Use the search engine to locate information	(G3.1.3.3.1) Define search engines	
			(G3.1.3.3.2) Find specific information on a web site	Search for different hobbies around the world. **Linked to English**

GRADE 4				
Domain	Strand	Standards	Learning outcomes	Integration
	(1.1) Computer Operation	(1.1.4) Expand student's typing ability and promote the correct keyboarding position	(G4.1.1.4.1) Students keyboard using correct hand, movement, arm, and body position.	**Interlinking to Science.** Design a food chart in Canva – Balanced Diet. They will write a message on the importance of a balanced diet.
			(G4.1.1.4.2) Promote Accuracy and speed of typing	
		(1.1.5) Identify the function of computer hardware components	(G4.1.1.5.1) Identify the types of storage devices	

		(1.1.9) Manipulate and control the windows desktop files and disks	(G4.1.1.9.1) Mange files using the windows explorer / file manager	
	(1.2) Productivity Tools	(1.2.5) Use a presentation tool to communicate and exchange ideas	(G4.1.2.5.1) Identify effective design principles for a simple presentation	**SDG**-14 - Prepare a PPT about various plants purifying the water and thereby making the water safer for humans and animals alike.
			(G4.1.2.5.2) Manage Slides.	
		(1.2.4) Use a media tool to communicate among classes or groups within a class	(G4.1.2.4.1) Create a simple movie	
		(1.2.8) Demonstrate the ability to use tools in word processing programs to communicate and exchange ideas	(G4.1.2.8.1) Insert objects	
			(G4.1.2.8.2) Modify documents	**SDG Goal 3: Good Health and Wellbeing & English** - The students will create a brochure or information card on mental and emotional well-being.
	(1.3) Internet Surfing and Information Retrieval	(1.3.2) Students should be able to use various web browser features	(G4.1.3.2.1) Utilize a web browser toolbar while browsing the Internet	
			(G4.1.3.2.2) Use advanced tools in a web browser	
		(1.3.4) Use technologies to locate, collect and organize information	(G4.1.3.4.1) Search the Internet for information based on specified keywords	**SDG Goal 2 Zero Hunger –** Movie on Zero Hunger

GRADE 5				
Domain	Strand	Standards	Learning outcomes	Integration
	(1.1) Computer Operation	(1.1.4) Expand student's typing ability and promote the correct keyboarding position	(G5.1.1.4.1) Students use correct hand, movement, arm, and body position	Type few sentences about **SDG Goal- 3. Good Health and Wellbeing**.
			(G5.1.1.4.2) Promote accuracy and speed of typing	Add few more sentences about **SDG Goal- 3. Good Health and Wellbeing.**
		(1.1.5) Identify the function of computer hardware components	(G5.1.1.5.1) Describe how hardware and software interact	Explain IPO cycle in a PPT with real life application of IPO
			(G5.1.1.5.2) Define simple terms and concepts related to the software development process	Prepare a flowchart on **SDG 6:Cleaan water and Sanitation**.
			(G5.1.1.5.3) Identify issues related to software upgrades	Type MS Office softwares & and its updates

1. Digital literacy and competence		(1.1.10) Use various operating system features.	(G5.1.1.10.1) Identify different control panel settings	Explore different control panel setting. Volume, Time, Device controls
	(1.2) Productivity Tools	(1.2.5) Use a presentation tools to communicate among classes or groups within a class	(G5.1.2.5.1) Modify a slide layout.	Prepare a PPT on **SDG – 1 No Poverty** and verify with different layouts
			(G5.1.2.5.2) Add animation and transitions to slides and objects	Apply animations and Transitions for the same
		(1.2.6) Demonstrate the ability to use tools in spreadsheet programs to communicate and exchange ideas	(G5.1.2.6.1) Define the spreadsheet	
			(G5.1.2.6.2) Create simple spreadsheet	Create a simple excel sheet on **SDG 13:Climate action** of various emirates
			(G5.1.2.6.3) Write formulas using arithmetic operators	In the above sheet, use formula.
		(1.2.8) Demonstrate the ability to use tools in word processing programs to communicate and exchange ideas	(G5.1.2.8.1) Use Text and Language Tools	Use text to language tools in a word document on **SDG – 4.Quality Education**
			(G5.1.2.8.2) Insert advanced objects	Insert pictures, symbols, charts in the above document.
Domain	Strand	Standards	Learning outcomes	Integration
1. Digital literacy and competence	(1.3) Internet Surfing and Information Retrieval	(1.3.5) Understand the meaning of network and their features	(G5.1.3.5.1) Download a file from a web site to specified location	Browse & download a file from a website to your desktop
			(G5.1.3.5.2) Define a network	
		(1.3.6) Perform basic searches to locate information, using techniques to refine and limit such searches	(G5.1.3.6.1) Develop the basic techniques to find specific file format	Type few file extensions
	(1.4) Collaboration Tools	(1.4.1) Communicate with other using appropriate technology including email	(G5.1.4.1.1) Identify the features of online communications	
			(G5.1.4.1.2) Apply communication tools (email)	
		(1.4.2) Communicate and collaborate with others using social network	(G5.1.4.2.1) Identify social network	
			(G5.1.4.2.2) Classify the features of online social networks	Classify the features of online social networks in PPT.

Student Performance Criteria

Grade 1				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Computer Operation	• identify 1 - 2 main parts of computer, sort types of computer based on size, power and purpose, elements of windows desktop and manipulate windows with a lot of assistance. • define 1 - 2 types of keys on the keyboard and rarely keeps fingers on the home row keys while typing.	• identify 2 - 4 main parts of computer, sort types of computer based on size, power and purpose, elements of windows desktop and manipulate windows with some a assistance. • define 3 - 4 types of keys on the keyboard and hardly keep fingers on the home row keys while typing.	• identify 2 - 4 main parts of computer, sort types of computer based on size, power and purpose, elements of windows desktop and manipulate windows with little a assistance. • define types of keys on the keyboard and keep fingers on the home row keys while typing with curved hands and proper wrist position most of the time.	• identify main parts of computer, sort types of computer based on size, power and purpose, elements of windows desktop and manipulate windows independently. • define types of keys on the keyboard and keeps fingers on the home row keys while typing with curved hands and proper wrist position almost the entire time.
Productivity Tools	• draw pictures using shapes tools only.	• draw pictures using different tools and enter simple text with some assistance.	• draw pictures and entering text using different tools.	• draw and edit pictures using different tools and easily work with text.
Internet and Information Search	• define Internet with many errors and open a website with a lot of assistance.	• define Internet with few errors and open a website with some assistance.	• define Internet with few errors and open a website with little assistance.	• define Internet and open a website independently.

Grade 2				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Computer Operation	• name and sort 0 - 2 parts of input and output devices and use OS start menu with a lot of assistance. • define 1 - 2 types of keys on the keyboard and rarely keeps fingers on the home row keys while typing.	• name and sort 3 - 5 parts of input and output devices and use OS start menu with some assistance. • define 3 - 4 types of keys on the keyboard and hardly keep fingers on the home row keys while typing.	• name and sort 5 - 7 parts of input and output devices and use OS start menu with little assistance. • define types of keys on the keyboard and keep fingers on the home row keys while typing with curved hands and proper wrist position most of the time.	• name and categorize 5 - 7 parts of input and output devices and use OS start menu independently. • define types of keys on the keyboard and keeps fingers on the home row keys while typing with curved hands and proper wrist position almost the entire time.
Productivity Tools	• draw pictures using drawing tools only with a lot of assistance.	• draw pictures using different tools and menus with some assistance.	• draw pictures using different tools and menus with little assistance.	• draw and edit pictures using different tools and menus independently.
Internet and Information Search	• list 0 - 2 of components required for an Inernet connection and open a website.	• list 2 - 3 components required for an Internet connection and navigate different website with some assistance.	• list 3 - 4 components required for an Internet connection and navigate different website with little assistance.	• list all components required for an Internet connection and navigate different website independently.

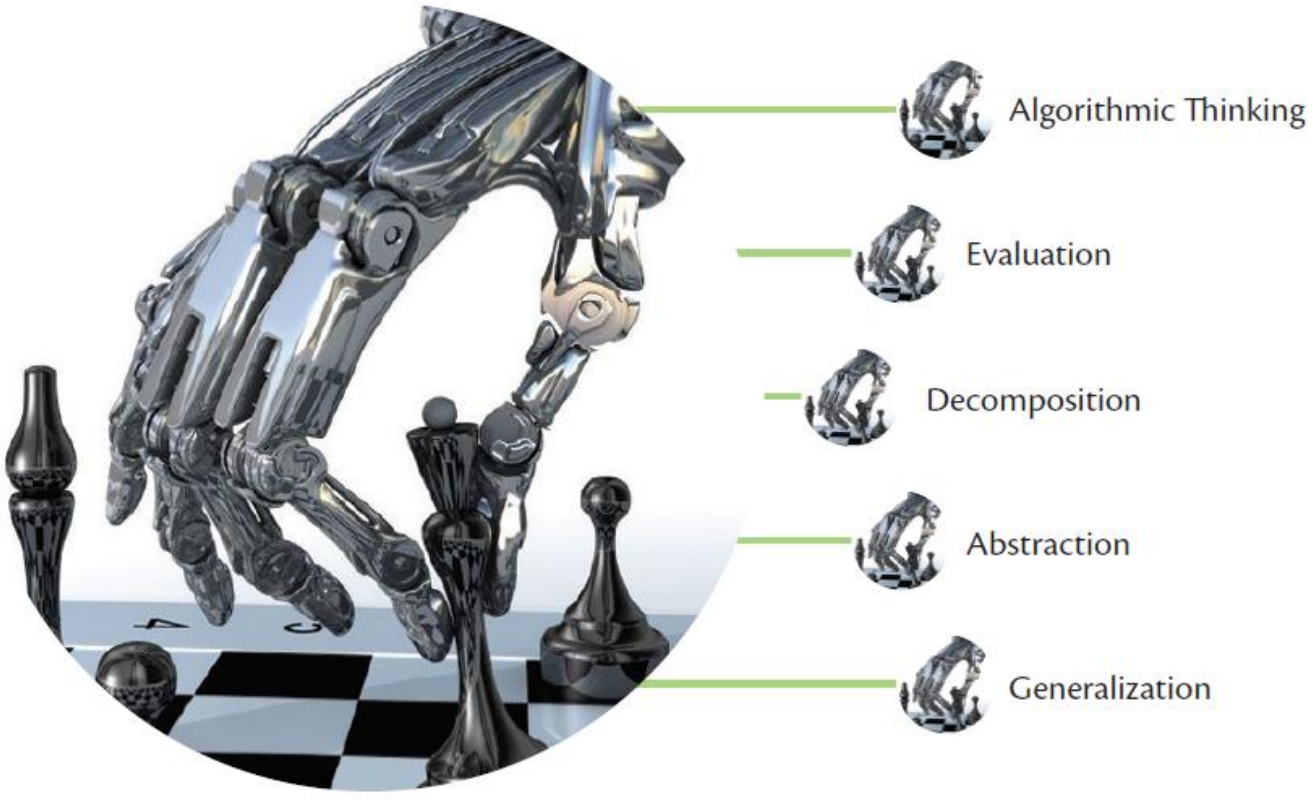
Grade 3				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Computer Operation	• name and show 0 - 2 parts of main processing components and manipulate folders and icons with a lot of assistance. • rarely keep fingers on the home row keys while typing with curved hands and proper wrist position.	• name and show 3 - 5 parts of main processing components and manipulate folders and icons with some assistance. • keep fingers on the home row keys while typing with curved hands and proper wrist position about half the time.	• name and show all parts of main processing components and manipulate folders and icons with little assistance. • keep fingers on the home row keys while typing with curved hands and proper wrist position most of the time.	• name and show all parts of main processing components and manipulate folders and icons independently. • keep fingers on the home row keys while typing with curved hands and proper wrist position almost the entire time.
Productivity Tools	• type and create document using the letter, number, space bar and enter keys • create simple presentation contain text only with a lot of assistance.	• change size, color and look of the text in a document with some assistance. • create 2 - 3 slides in presentation contain only text.	• change size, color and look of the text in a document with little assistance. • create 3 - 5 slides in presentation contain text and pictures.	• change the size, color and look of the text to make their document more interesting. • create 5 - 7 slides in presentation contain text, pictures and shapes.
Internet and Information Search	• identify 0 - 2 terminology related to the Internet and define search engines with many of errors.	• identify 3 - 4 terminology related to the Internet and define search engines with few errors	• identify 4 - 5 terminology related to the Internet, navigate different website using intermediate functions and use search engines to find information with little assistance.	• identify 6 terminology related to the Inernet, navigate different website using intermediate functions and easily use search engines to find information in specific topic.

Grade 4				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Computer Operation	• name 0 - 2 types of storage devices and use windows explorer to create folder with a lot of assistance. • produce more than 15 spelling and grammar mistakes (0 - 69% level of accuracy).	• name 3 - 5 types of storage devices and use windows explorer to create folder, change view and copy, move files or folders. • produce between 11 - 15, spelling and grammar mistakes (70 - 79% level of accuracy).	• name 5 - 6 types of storage devices and use windows explorer to create, rename, copy folder or files and view their properties. • produce between 5 - 10, spelling and grammar mistakes (80 - 89% level of accuracy).	• name 7 types of storage devices and use windows explorer to create, rename, copy folder or files with, view file or folder properties and using recycle bin. • produce few spelling and grammar mistakes, between 1 - 4 (90 - 99% level of accuracy).
Productivity Tools	• format text with stumble through inserting pictures and shapes in word processing. • create simple presentation, placing pictures and clipart with a lot of assistance. • storyboard of the movie shows little to no • evidence of preplanning. Over use or misuse of graphics, color, effects, transitions and	• format text with ability of finding, inserting and resizing in word processing with some assistance. • create simple presentation, placing pictures or clipart choosing colors and layout of slide with some assistance. • storyboard of the movie shows some evidence • of pre - planning with	• format paragraph with ability of finding, inserting and resizing clipart illustrations in word processing with little assistance. • create simple presentation, placing pictures or clipart, use colors and layouts that make the information clear with little assistance. • storyboard of the movie shows	• format paragraph with ability of finding, inserting and resizing clipart illustrations in word processing independently. • create simple presentation, placing pictures or clipart, and use design skills or select a template to make presentation easy to view independently. • storyboard shows strong evidence of pre

	music in creating movie.	somewhat vague goal in mind. Makes attempted use of graphics, color, effects, transitions and music was inappropriate to topic.	evidence of pre-planning with clear intent in mind. Makes a good use of color, graphics, effects, transitions and music.	• - planning and achieves the goal. Excellent use of color, graphics, effects, transitions and music was clearly planned.
Internet and Information Search	• define web browser with a lot of errors and Needs assistance throughout process from key term or search word selection to result selection.	• define web browser with few errors, use basic tool bar and construct a search with some assistance.	• define web browser, use 3-4 advance tool bar, and select suitable terms or phrases in searching with little assistance.	• define web browser, use 5 advance tool bar, and select suitable terms or phrases in searching independently.

Grade 5				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Computer Operation	• describe how hardware and software interact with a lot of errors and customizing the desktop display with a lot of assistance. • produce more than 15 spelling and grammar mistakes (0-69% level of accuracy).	• stumble in describing how hardware and software interact with few errors and customizing the desktop display with some assistance. • produce between 11-15, spelling and grammar mistakes(70-79% level of accuracy).	• describe how hardware and software interact, upgrade software, customizing the desktop display, mouse, Keyboard, date & time, and install new fonts with a little assistance. • produce between 5-10, spelling and grammar mistakes (80-89% level of accuracy).	• describe how hardware and software interact, upgrade software, customizing the desktop display, mouse, Keyboard, date & time, and install new fonts independently. • produce few spelling and grammar mistakes, between 1-4 (90-99% level of accuracy).
Productivity Tools	• spot and correct spelling mistakes in their writing document but might miss one or two. • modify slide layout and use animated clipart that helps to explain idea. • format and organize the spreadsheet with a lot of assistance. Spreadsheet has no formula(s).	• spot and correct spelling errors in writing document but might have one spelling or grammar error. • modify slide layout, use animated clipart, add clipart sound and video in presentation. • format and organize spreadsheet with some assistance. Formula(s) cannot be used to correctly determine the needed information.	• spot and correct spelling errors, check grammar, find/replace, and use word account in writing document. • add sounds, timing to slide transitions, insert clipart sound and video. • format and organize spreadsheet with little assistance. Formula(s) will correctly determine the needed information.	• spot and correct spelling errors, check grammar errors, find/replace, use word account, thesaurus and translate in writing document • add custom animation to pictures and text to add meaning and emphasis to the presentation. • format and organize spreadsheet independently. Formula(s) are well - developed and will correctly determine the needed information.
Internet and Information Search	• define network with a lot of errors and download file from the Inernet with a lot of assistance.	• define network with few errors and download file form the Inernet with some assistance.	• define network and download file from Inernet with little assistance.	• define network and download file to specific place in a computer independently.
Collaboration Tools	• identify the features of online communications and social networks with a lot of errors. create email with a lot of assistance	• identify the features of online communications and social networks with a few of errors. create email with some assistance.	• identify the features of online communications and social networks with little errors. create, receive and send emails with some assistance.	• identify the features of online communications and social networks, create, receive and send independently.

Domain 2 : Computational Thinking (CT)



Domain 2: Computational Thinking (CT)

Definition

Computational thinking is the thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information - processing agent.

There are five core concepts involved in computational thinking:

- Algorithmic thinking
- Evaluation
- Decomposition
- Abstraction
- Generalization

Algorithmic thinking is a way of getting to a solution through clear definition of the steps. Rather than coming up with a single answer, like 42, the students develop a set of instructions or rules that if followed precisely (whether by a person or a computer) leads to answers to that and similar problems.

Evaluation is the process of ensuring an algorithmic solution is a good one: that it is fit for purpose. Various properties of algorithms need to be evaluated including whether they are correct, are fast enough, are economic in the use of resources, are easy for people to use and promote an appropriate experience. Trade - offs need to be made as there is rarely a single ideal solution for all situations. There is a specific and often extreme focus on attention to detail in computational thinking based evaluation.

Decomposition is a way of thinking about problems, algorithms, artifacts, processes and systems in terms of their parts. The separate parts can then be understood, solved, developed and evaluated separately. This makes complex problems easier to solve and large systems easier to design.

Abstraction involves hiding detail and removing unnecessary complexity. The skill is in choosing the right detail to hide so that the problem becomes easier without losing anything that is important.

Generalization is a way of quickly solving new problems based on previous problems we have solved.

Generic Outcomes

G1 - G5 (cycle 1)

By the end of cycle 1, students will be able to:

1. differentiate various artifacts based on certain parameters.
2. demonstrate the ability to follow steps of simple processes.
3. demonstrate ability to rank, sort, and search objects manually based on some criteria.
4. demonstrate the ability to use logical thinking tools.

At this stage, student will be able to use different technological resources to solve simple problems to illustrate his/her thoughts, ideas, and stories in a step-by-step manner. Different online visual coding resources such as (code.org) will be used to give appropriate logical instructions to solve logical problems which involve sequences, repetitions and conditional instructions. In addition, student will be able to use logical thinking programs to solve some puzzles. Student will be able to understand how to arrange (sort) information into useful order. Moreover, student will be able to describe the process of sorting items from smallest to biggest as well as finding or inserting items in a sorted set of items.

Strands Description and Technical Keywords

	Strand Title	Strand Description	Key words
1	Algorithmic Thinking	Algorithmic thinking aims to build the problem solving skill and methodology. It allows the students to identify the problem components (i.e. input, output, and processing) prior to developing the solution. In addition to using various techniques to organize the solution steps.	Function, loop, iteration, conditional statements, procedure, parallel processing, data structures
2	Abstraction	Abstraction removes unnecessary details and focuses on the fundamental problem. It requires the ability to identify patterns in data. Through modeling and simulation, some systems problems maybe abstracted.	Modeling, simulation, pattern recognition, abstraction

Strands Evolution Per Grade

Domain	Strand	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Computational Thinking	Algorithmic Thinking	• Utilize technological resources to solve simple problems • Utilize authoring tools, digital cameras, and drawing tools to illustrate thoughts and ideas in a step-by-step manner	• Utilize technological resources to solve simple problems • Utilize authoring tools, digital cameras, and drawing tools to illustrate thoughts and ideas in a step-by-step manner	• Utilize technological resources to solve simple problems • Utilize authoring tools, digital cameras, and drawing tools to illustrate thoughts, ideas, and stories in a step-by-step manner	• Utilize technological resources to solve simple problems • Illustrate thoughts, ideas, and stories in a step-by-step manner	• Utilize technological resources to solve simple problems • Utilize technological resources to solve simple problems
	Abstraction	• Understand how to arrange (sort) information into useful order	• Understand how to arrange (sort) information into useful order	• Understand how to arrange (sort) information into useful order	• Understand how to arrange (sort) information into useful order	• Understand how to arrange (sort) information into useful order

Scope and Sequence
Domains, Strands and Standards by Grade

Grade 1				
Domain	Strand	Standards	Learning outcomes	Integration
2. Computational Thinking	(2.1) Algorithmic thinking	(2.1.1) Utilize technological resources to solve simple problems	(G1.2.1.1.1) Solve simple maze following step by step solution pattern	Students will use the coding game(Blockly games(Maze)-put the code in sequential order)
			(G1.2.1.1.2) Play guessing games with classmate to develop guessing strategy	Students will use the coding game(Blockly games(Puzzle)-guess the characteristics of animals)
		(2.1.2) Utilize authoring tools, digital cameras, and drawing tools to illustrate thoughts and ideas in a step-by-step manner	(G1.2.1.2.1) Illustrate steps needed to complete simple task using simple computer graphics program	Students will use the coding game(Code.org-Sequencing with Angry Birds)
	(2.2) Abstraction	(2.2) Understand how to arrange (sort) information into useful order	(2.2.1) Sort objects in a requested order	Students will use the coding game(Code.org-Learn to drag and drop)

Grade 2				
Domain	Strand	Standards	Learning outcomes	Integration
2. Computational Thinking	(2.1) Algorithmic thinking	(2.1.1) Utilize technological resources to solve simple problems	(G2.2.1.1.1) Demonstrate logical thinking through puzzles or guessing games	Blockly Games to solve puzzle by arranging the blocks in sequence
			(G2.2.1.1.2) Give appropriate logical instructions to solve simple problems using logical thinking tools	Blockly Games to solve maze games by putting the blocks in correct sequence **(Linked to MATH)**
		(2.1.2) Utilize authoring tools, digital cameras, and drawing tools to illustrate stories in a step-by-step manner	(G2.2.1.2.1) Describe process to accomplish a simple task	Hour of code-Sequencing & looping with angry birds **(Linked to MATH)**
			(G2.2.1.2.2) Build animated stories using logical thinking tools	Animated stories using ABCYA for the SD Goal-2 **(Linked to English and Science)**

	(2.2) Abstraction	(2.2.1) Understand how to arrange (sort) information into useful order	(2.2.1) Sort large number of items of different sizes from biggest to smallest by dividing them into smaller groups	Hour of code- Loops with Laurel (**Linked to MATH)**
			(2.2.2) Sort basketball team players from shortest to tallest	Hour of code- Loops with Harvester (**Linked to MATH)**

Grade 3				
Domain	Strand	Standards	Learning outcomes	Integration
2. Computational Thinking	(2.1) Algorithmic thinking	(2.1.1) Utilize technological resources to solve simple problems	(G3.2.1.1.1) Solve logical problems using logical thinking tools	
			(G3.2.1.1.2) Solve puzzle which involves repetition and logical instructions using logical thinking tools	
		(2.1.2) Utilize authoring tools, digital cameras, and drawing tools to illustrate thoughts, ideas, and stories in a step-by-step manner	(G3.2.1.2.1) Describe a step by step solution to sum several numbers	Program in Tynker on Repeat, loops etc. **Linked to MATH**
			(G3.2.1.2.2) Illustrate the process of sorting objects	
	(2.2) Abstraction	(2.2.1) Understand how to arrange (sort) information into useful order	(G3.2.2.1.1) Describe the process of sorting items	
			(G3.2.2.1.2) Insert new item in an already sorted set of items	

Grade 4				
Domain	Strand	Standards	Learning outcomes	Integration
2. Computational Thinking	(2.1) Algorithmic thinking	(2.1.1) Utilize technological resources to solve simple problems	(G4.2.1.1.1) Provide appropriate logical instructions to solve logical problems.	**SDG Goal 3: Good Health and wellbeing**- Movie on Good Health & Well being
			(G4.2.1.1.2) Solve puzzle which involves repetition	
		(2.1.2) Illustrate thoughts, ideas, and stories in a step-by-step manner	(G4.2.1.2.1) Illustrate step by step instructions to perform multiplications and division	Link to Math- Scratch coding – Using direction blocks to create shapes.

			(G4.2.1.2.2) Illustrate the process of inserting new object in an already sorted set of objects	
	(2.2) Abstraction	(2.2.1) Understand how to arrange (sort) information into useful order	(G4.2.2.1.1) Sort given sets of objects in an efficient way (minimum number of steps)	**Link to English** Design pictures in Tux Paint and arrange the slides to make as a story in Tux paint.
			(G4.2.1.1.2) Insert new item in an already sorted set of item in an efficient way (minimum number of steps)	

Grade 5				
Domain	Strand	Standards	Learning outcomes	Integration
2. Computational Thinking	(2.1) Algorithmic thinking	(2.1.1) Utilize technological resources to solve simple problems	(G5.2.1.1.1) Provide appropriate logical instructions to solve logical problems which involve repetition and conditional instructions	Prepare an algoritham to purify water. **SDG – 6 Clean water and Sanitation (Linked to SCIENCE)**
			(G5.2.1.1.2) Solve puzzles which involve repetition and conditional instructions	Prepare a flowchart to check the eligiblity of voting. **(Linked to SST)**
		(2.1.2) Illustrate thoughts, ideas, and stories in a step-by-step manner	(G5.2.1.2.1) Illustrate step by step instructions to perform sorting	Prepare an algoritham to sort numbers **(Linked to MATH)**
			(G5.2.1.2.2) Illustrate step by step instructions to perform inserting	
	(2.2) Abstraction	(2.2.1) Understand how to arrange (sort) information into useful order	(G5.2.2.1.1) Describe the process of sorting items from smallest to biggest	
			(G5.2.2.1.2) Describe the process of finding items in a sorted set of items	

Student Performance Criteria

Grade 1				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Computational Thinking	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Algorithmic Thinking	• show some attempts to solve maze • show some of the steps needed to complete task	• solve maze with help of teacher • show some of the steps needed to complete task	• solve simple maze • illustrate steps needed to complete task.	• solve simple maze with easiness • Illustrate steps to complete task clearly and correctly.
Abstraction	• sort students from shortest to tallest with the help of teacher.	• sort students from shortest to tallest with some help from the teacher.	• sort students from shortest to tallest without any help.	• short students from shortest to tallest without any difficulty.

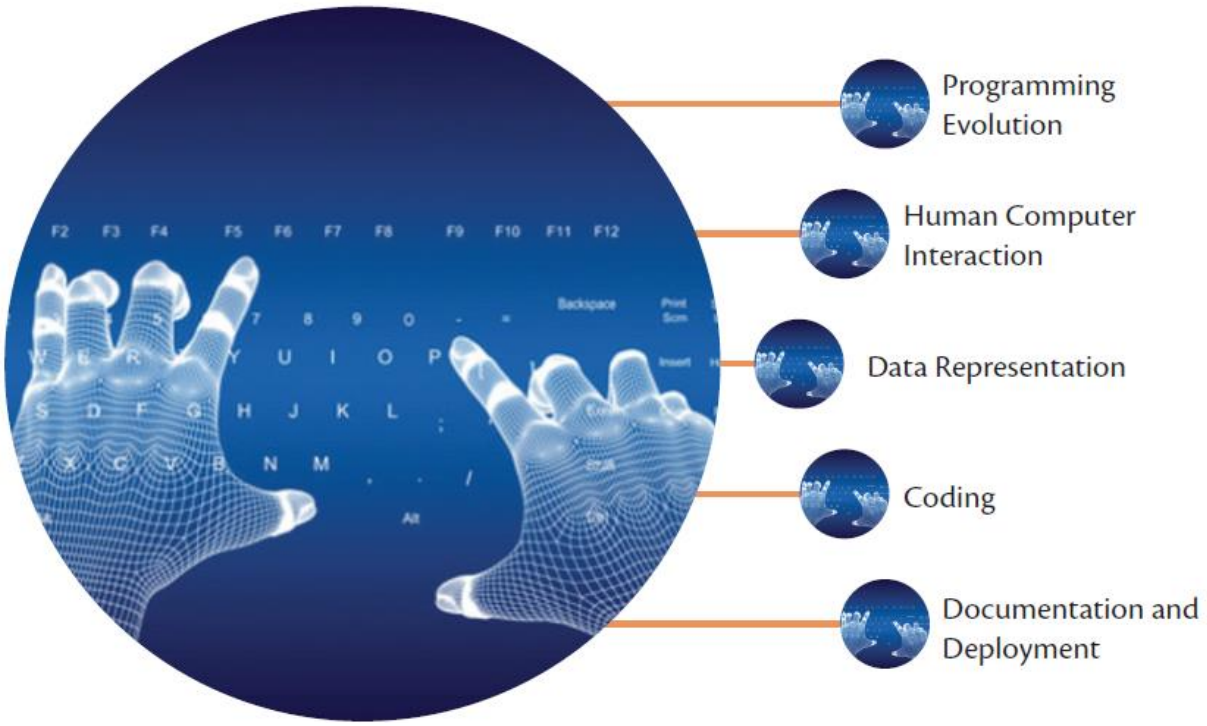
Grade 2				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Computational Thinking	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Algorithmic Thinking	• demonstrate little or no logical thinking while solving puzzle. • describe the process of making certain tasks with some.	• demonstrate some logical thinking while solving puzzle. • describe process of making certain task with the help of the teacher.	• demonstrate logical thinking while solving puzzle. • describe process of making certain tasks.	• demonstrate effective logical thinking while solving puzzle. • clearly describe the process of making certain task.
Abstraction	• sort small number of items from smallest to biggest.	• sort large number of items from smallest to biggest with the help of teacher.	• sort large number of items.	• sort large number of times efficiently by dividing them into smaller groups.

Grade 3				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Computational Thinking	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Algorithmic Thinking	• attempt to solve logical problem, but being able to give solution.	• provide partial solution for logical thinking problem.	• solve logical thinking problems.	• solve puzzle which involves repetition and logical instructions.
Abstraction	• describe general steps needed to sort items from smallest to biggest.	• describe the process of sorting items from smallest to biggest with some missing steps.	• describe the process of sorting items from smallest to biggest.	• describe the process of sorting items from smallest to biggest and the process and inserting new item in an already sorted set of items.

Grade 4				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Computational Thinking	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Algorithmic Thinking	• provide incomplete logical instructions to solve logical problems. • show some attempts to solve simple puzzle.	• provide logical instructions to solve logical problems with hesitation. • shows some difficulty and challenge while solving puzzle which involves repetition.	• provide appropriate and complete logical instructions to solve logical problems. • solve puzzle which involves repetition.	• provide appropriate and complete logical instruction to solve difficult logical problems. • solve puzzle with involves repetition in noticeably short time.
Abstraction	• sort given sets of objects from smallest to biggest.	• sort given sets of objects from smallest to biggest with the minimum number of steps.	• sort given sets of objects from smallest to biggest, and insert new item in an already sorted set of item with the minimum number of steps.	• apply sorting and insertion algorithms to real world problem in an efficient manner.

Grade 5				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Computational Thinking	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Algorithmic Thinking	• provide appropriate logical instructions to solve logical problems.	• provide appropriate logical instructions to solve logical problems which involve repetition and conditional instructions.	• provide appropriate logical instructions to solve logical problems and puzzles which involve repetition and conditional instructions.	• provide appropriate logical instructions to solve real world problems which involve repetition and conditional instructions.
Abstraction	• roughly describing the process of sorting items from smallest to biggest.	• describe the process of sorting items from smallest to biggest.	• describe the process of sorting items from smallest to biggest and the process of finding items in a sorted set of items.	• describe the process of sorting items from smallest to biggest and the process of finding items in an unordered set of items.

Domain 3 : Computer Practice and Programming (CPP)



Domain 3: Computer Practice and Programming (CPP)

Definition

In this domain students are taught the principles of information and computation, and how to put this knowledge to use through programming. Computer programming is the process of writing computer programs. It is the process that starts from the understanding of a real word problem that is formulated as a computer problem, followed by the development of an algorithm. Then, this algorithm is implemented in a programming language and tested on several instances of the given problem for correctness, validity and efficiency[1].

Upon completion of this domain, students are able to:

1. analyze the problem and identify the various requirements
2. understand algorithms, logic and data representation
3. translate algorithms into computer programs
4. test computer programs for correctness and validity
5. document computer programs properly

The strands to be covered are:

- **Programming Evolution:** covers the development of programming languages
- **Human Computer Interaction (HCI):** involves the study, planning, design and uses of the interfaces between people (users) and computers
- **Data Representation:** refers to the methods used internally to represent information stored in a computer
- **Coding:** implement algorithms into a programming language
- **Testing and Validation:** apply a series of test cases to a program to determine if it is working properly
- **Documentation and Deployment:** add proper internal and external documentation to the program to make it easy to understand and deploy the program on the right platform

Generic Outcomes

G1 - G5 (cycle 1)

By the end of cycle 1, students will be able to:

1. understand the basic fundamental principles and concepts of computer programming.
2. apply the fundamental principles and concepts of computer programming to solve age appropriate problems.
3. Implement problem solutions using age appropriate application like games, simulations, etc.

Student understands the basic fundamental principles and concepts of computer programming and uses them to solve age appropriate problems. Then he/she implements these solutions using age appropriate computer tools.

Strands Description and Technical Keywords

	Strand Title	Strand Description	Key words
1	Programming Evolution- Gr3 to 5	Covers the development of programming languages.	Block - based programming, Platforms, Programming languages
2	Human Computer Interaction (HCI)- Gr4 & Gr5	Involves the study, planning, design and uses of the interfaces between people (users) and computers.	Objects, Elements, Visible, Non Visible, Graphical User Interface (GUI), Input, Output
3	Coding	Translating algorithms into a programming language	Sequence, drag and drop, block programming, loops, iteration, selection, control, conditional, game.
4	Testing and Validation	Apply a series of test cases to a program to determine if it is working properly	Run program, build, clean, trace, locate errors, fix errors.

Strands Evolution Per Grade

Domain	Strand	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Computer Practice and Programming	Programming Evolution			• Student understands the general meaning of programming paradigms.	• Student understands the concept of a programming paradigms.	• Student understands difference between programming paradigms.
	Human Computer Interaction (HCI)				• Student develops understanding of the use of available characters.	• Student develops understanding of the use of available characters.
	Coding	• Student understands how to connect visual blocks to build programs using sequence and repetition.	• Student understands how to connect visual code blocks to build programs using sequence and repetition.	• Student understands and uses logical condition.	• Student understands how to implement solutions using a block based visual programming language for age appropriate problem.	• Student is able to implement solutions using a block based visual programming language for age appropriate problems.
	Testing and Validation	• Student tests the program for correctness.	• Student tests and debugs program for correctness.	• Student chooses suitable test data to ensure program correctness.	• Student understands the use of unit testing to ensure program correctness.	• Student demonstrates the ability to choose suitable testing data to ensure program correctness.

Scope and Sequence
Domains, Strands and Standards by Grade

Grade: 1				
Domain	Strand	Standards	Learning outcomes	Integration
3. Computer Practice and Programming	(3.4) Coding	(3.4.2) Student understands how to connect visual blocks to build programs using sequence and repetition.	(G1.3.4.2.1) Arrange set of commands to perform tasks	
			(G1.3.4.2.2) Repeat a single command	Students will use the coding game(Code.org-Loops with Scratch)
	(3.5) Testing and Validation.	(3.5.1) Student tests the program for correctness.	(G1.3.5.1.1) Run the program for correctness	
			(G1.3.5.1.2) Fix errors if any	

Grade: 2				
Domain	Strand	Standards	Learning outcomes	Integration
3. Computer Practice and Programming	(3.4) Coding	(3.4.2) Student understands how to connect visual blocks to build programs using sequence and repetition.	(G2.3.4.2.1) Arrange sequential events into their logical order.	Blockly Games to solve puzzle and maze games by putting the blocks in correct sequence **(Linked to MATH)**
			(G2.3.4.2.2) Repeat a set of steps to perform a task.	Hour of code- Loops with Laurel & loops with harvester **(Linked to MATH)**
	(3.5) Testing and Validation.	(3.5.1) Student tests the program for correctness.	(G2.3.5.1.1) Demonstrate the ability to trace a set of steps.	Scratch – Arranging the blocks to solve the task in a step-by-step process. **(Linked to MATH)**

Grade: 3				
Domain	Strand	Standards	Learning outcomes	Integration
3. Computer Practice and Programming	(3.1) Programming Evolution	(3.1.1) Student understands how to connect visual blocks to build programs using sequence and repetition.	(G3.3.1.1.1) Define a programming paradigms.	
	(3.4) Coding	(3.4.3) Student understands and uses logical condition.	(G3.3.4.3.1) List different logical operators.	Students will create a program in scratch with If - then statements. **Linked to Math**
			(G3.3.4.3.2) Use selection in program.	
	(3.5) Testing and Validation.	(3.5.2) Student chooses suitable test data to ensure program correctness.	(G3.3.5.2.1) Select data that produce output for the selected conditions.	
			(G3.3.5.2.2) Choose test data to test the program.	

Grade: 4				
Domain	Strand	Standards	Learning outcomes	Integration
3. Computer Practice and Programming	(3.1) Programming Evolution	(3.1.2) Student understands the concept of a programming paradigms.	(G4.3.1.2.1) List programming paradigms.	**Linked to Science –** Scratch block to include music blocks on the topic Clothes.
	(3.3) Human Computer Interaction (HCI)	(3.3.1) Student develops understanding of the use of available characters.	(G4.3.3.1.1) Create interface to a story using available characters.	
	(3.4) Coding	(3.4.4) Student understands how to implement solutions using a block based visual programming language for age appropriate problem.	(G4.3.4.4.1) Create function to accomplish a task.	**SDG 13 Climate Action** Using Scratch coding to present the issues with climate action and its solutions
			(G4.3.4.4.2) Modify an existing function to complete a different task.	
	(3.5) Testing and Validation.	(3.5.3) Student understands the use of unit testing to ensure program correctness.	(G4.3.5.3.1) Test the correctness of the function.	
			(G4.3.5.3.2) Test the whole program.	
	(3.6) Deployment and Documentation	(3.6.1) Student understands to share a creative artifact with other students.	(G4.3.6.1.1) Share link of story with other students.	**SDG- 7: Affordable and Clean Energy** Scratch – coding to include dialogues on the benefits of clean energy

Grade: 5				
Domain	Strand	Standards	Learning outcomes	Integration
3. Computer Practice and Programming	(3.1) Programming Evolution	(3.1.2) Student understands the concept of a programming paradigms.	(G5.3.1.2.1) Discuss the difference between programming paradigms.	Differentiate Scratch and other coding apps
	(3.3) Human Computer Interaction (HCI)	(3.3.1) Student develops understanding of the use of available characters.	(G5.3.3.1.1) Create interface to a story using available characters.	Create a story in Powtoon on **SDG:5 Gender Equaity. (Linked to SST)**
	(3.4) Coding	(3.4.5) Student implements solutions using a block based visual programming language for age appropriate problems.	(G5.3.4.5.1) Use programming techniques to solve problems.	Use scratch to solve problems on **SDG 13:Climate Action (Linked to SCIENCE)**
			(G5.3.4.5.2) Break a sequence of steps into a hierarchy or looped sequences.	
	(3.5) Testing and Validation.	(3.5.4) Student demonstrates the ability to choose suitable testing data to ensure program correctness.	(G5.3.5.4.1) Choose test data to test all possible paths in a program.	Use Scratch to find solution for **SDG 14:Life below water (Linked to SCIENCE)**
			(G5.3.5.4.2) Choose test data to test termination of loops.	
	(3.6) Deployment and Documentation	(3.6.1) Student understands to share a creative artifact with other students.	(G5.3.6.1.1) Explore what information is appropriate to be put online.	

Student Performance Criteria

Grade 1				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Coding	• order a set of commands in a dis-organized way.	• order a set of commands with some organization and logic.	• order a set of commands with most organization and logic.	• order a set of commands with organization and logic.
Testing and Validation	• try to test the program but unable to correct errors (if any).	• test the program and correct some errors (if any).	• test the program and correct most errors (if any).	• test the program and correct all errors (if any).

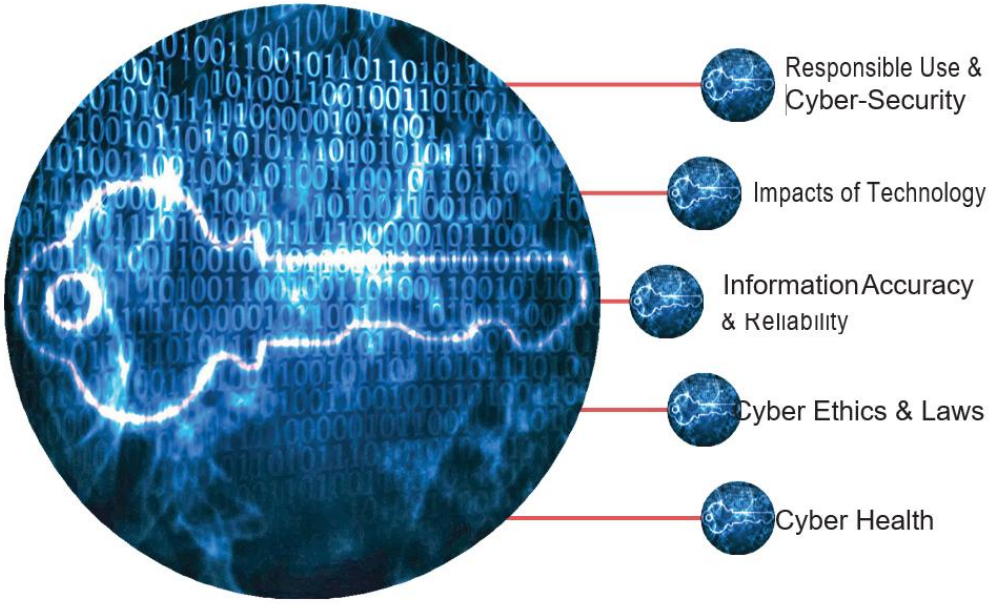
Grade 2				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Coding	• demonstrate limited ability to use repetitions with many errors.	• demonstrate some ability to use repetition with few errors.	• demonstrate considerable ability to use repetitions with no errors.	• demonstrate complete ability to use repetitions with confidence.
Testing and Validation	• try to check the program but unable to correct errors (if any).	• check the program and correct some errors (if any).	• check the program and correct most errors (if any).	• check the program completely and correct all errors (if any).

Grade 3				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Programming Evolution	• define programming paradigms with many errors.	• define programming paradigms with some errors.	• define programming paradigms with few errors.	• define programming paradigms with confidence.
Coding	• use condition and logical operations in wrong way.	• use condition and logical operations with some errors.	• use condition and logical operations with very few errors.	• use condition and logical operations with confidence.
Testing and Validation	• test very few program actions but unable to correct any errors (if any).	• test program actions to some extend and correct some errors (if any).	• test most program actions and correct most errors (if any).	• test all program actions and correct all errors (if any).

Grade 4				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Programming Evolution	• list one programming paradigm or none.	• list few programming paradigms with some errors.	• list most programming paradigms with few errors.	• list all programming paradigms with confidence.
HCI	• add random characters to interface in a disorganized and confusing way.	• add characters to interface but most of them are not related to the storyline.	• add to interface characters which align with the storyline, and match the scale of the set.	• add to interface characters which are very suitable to the storyline, and very well organized.
Coding	• create inappropriate functions with many errors.	• create few appropriate functions with some logical errors.	• create inefficient but appropriate functions.	• create efficient and appropriate functions.
Testing and Validation	• test programs but unable to correct most errors and all functions are considered untested.	• test programs, correct some errors and some functions can be considered as tested.	• test programs, correct most errors and most functions can be considered as tested.	• test programs, correct all errors and all functions are fully tested.
Documentation and Deployment	• understand the benefit of sharing stories but unable to do it.	• share undocumented stories with some difficulties.	• share documented stories with few difficulties.	• share well documented stories with no difficulties.

Grade 5				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Digital Literacy and Competence	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Programming Evolution	• list very few differences between programming paradigms with many errors.	• list some differences between programming paradigms.	• list most differences between programming paradigms.	• list and discuss differences between programming paradigms.
HCI	• add to interface random characters in a disorganized and confusing way.	• add to interface characters but most of them are not related to the storyline.	• add to interface characters which aligned with the storyline, and matched the scale of the set.	• add to interface characters which are very suitable to the storyline, and very well organized.
Coding	• use sequences and loops with many errors.	• use sequences and loops with some errors.	• use sequences and loops with very few errors.	• use sequences and loops with no errors.
Testing and Validation	• choose test data randomly with no purpose and unable to correct any errors.	• choose test data to cover some cases, and correct some errors.	• choose test data to cover most cases and correct most errors.	• choose efficient test data to cover all cases and correct all errors.
Documentation and Deployment	• share fragmented and highly disorganized information so the intended purpose is not achieved.	• share un - synthesized and disorganized information so the intended purpose is not fully achieved.	• share synthesized and organized information inefficiently so the intended purpose is almost achieved.	• share synthesized, well organized information so the intended purpose is fully achieved.

Cyber Security, cyber Safety, and Cyber Ethics (CCC)



Domain 4: Cyber Security, Cyber Safety, and Cyber Ethics (CCC)

Definition

Computers and networks are a diverse experience that affect society at all levels and goes beyond local borders. The ethical use of computers and networks is a fundamental aspect of computer science at all levels and should be seen as an essential element of both learning and practice.
The domain will encompass four expanding circles: the personal circle, community circle, global circle & future circle. At each circle, the student will be introduced with different concepts related to the strands listed below.

The strands to be covered are:

- Responsible Use & Cyber-Security
- Impacts of Technology
- Information Accuracy & Reliability
- Cyber Ethics & Laws
- Cyber Health

Few general examples are provided in the paragraphs below.

Computing, like all technologies, has a profound impact on any culture into which it is placed. The distribution of computing resources in a global economy raises issues of equity, access, and power. Social and economic values influence the design and development of computing innovations. Students should be prepared to evaluate the various positive and negative impacts of computers on society and to identify the extent to which issues of access (who has access, who does not, and who makes the decisions about access) impact our lives.

Generic Outcomes

It is essential that K-12 students understand the impact of computers on international communication. They should learn the difference between appropriate and inappropriate social networking behaviors. They should also appreciate the role of adaptive technology in the lives of people with various disabilities.

G1 - G5 (cycle 1)

By the end of cycle 1, students will be able to discuss the consequences of prolong use of computers, why it is important to refer to parents and guardians when using new technology, proper and responsible use of technology and how to avoid improper use. They will also be able to discuss reliable online sources, securing online accounts with strong passwords, and sharing personal information online. Students will be able to demonstrate understanding about ergonomics basics, ethical behaviors when being online, fake websites, how to use public digital facilities responsibly, how technology affect & support people with special needs, proper/improper social networking behaviors, how to protect against data loss, and content theft.

As soon as students begin using the Internet, they should learn the norms for its ethical use. Principles of personal privacy, network security, software licenses, and copyrights must be taught at an appropriate level in order to prepare students to become responsible citizens in the modern world.

Students should be able to make informed and ethical choices among various types of software such as proprietary and open source and understand the importance of adhering to the licensing or use agreements. Students should also be able to evaluate the reliability and accuracy of information they receive from the Internet.

The following learning outcomes will be shared in terms of coverage between this domain and the "Cyber Security, Cyber Safety, and Cyber Ethics (CCC)" domain as fit in domain strands:

- Apply proper manners when communicating via emails
- Discuss best practices to be adopted when sending and receiving emails
- Differentiate between using school email account and personal email account
- Perform basic security setup on a home Wi-Fi router to protect their home network against intruders
- Demonstrate responsible judgments regarding allowed/not allowed access to others Wi-Fi networks
- Define reliable online sources
- Differentiate between reliable and unreliable online sources
- Discuss reliability in specific contexts giving some examples
- Describe a variety of strategies for determining the reliability of information found on the Inernet
- Discuss common types of online sources used to get information
- Perform online search using multiple search engines and document the results
- Evaluate the results of different online sources from different search engines
-

Strands Description and Technical Keywords

	Strand Title	Strand Description	Key words
1	Responsible Use & Cyber-Security	Covers topics related to responsible use of technology, proper exchange/ share/communication of information, securing private information when being online, protecting against malware.	social networking do's/don'ts, shared resources, misusing shared resources, proper use of mobile phones, spreading rumors online, legal and ethical behaviors, what to share; when; with whom, social engineering.
2	Impacts of Technology	Covers topics related to the impact of Knowledge Economy on local and global level. Furthermore, it discusses issues related to how business can be conducted online using any Internet - based application and appropriate online buying behaviors.	trustworthiness of online content, secured websites, https, disclosing information through the inernet, digital footprint, cyber - bullying, identity theft phishing, managing passwords.
3	Information Accuracy & Reliability- Gr3 to Gr5	Covers topics related to the integrity and credibility of electronic information sources, and how students can evaluate Internet resources.	submitting someone's work as their own, taking passages from their own previous work without adding citations, re-writing someone's work without properly citing sources, fails to change the structure and wording of the borrowed ideas enough, inaccurately citing the source, relying too heavily on other people's work, fails to bring original thought into the text
4	Cyber Ethics & Laws Gr3 to Gr5	Discuss topics related to reliable and equal access to technology including support to people with special needs, and governing communication and technology use.	accountability, acceptable use policy (AUP), intellectual property, copyrights, copyright infringement, public domain, UAE cyber laws/ rules, internet bank fraud, cyber harassment, software piracy, inernet offenses, illegal access (intrusion), consequences of internet crimes, protecting oneself from being a victim, freeware, shareware, digital divide, knowledge & information sharing
5	Cyber Health	Introduce and examine physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them.	prolong use of computers, eye strain, internet/online games addiction, computer wastes disposal, repetitive motion injuries (RMIs), musculoskeletal disorders (MSDs)

Strands Evolution Per Grade

Domain	Strand	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Cyber Security, Cyber Safety, and Cyber Ethics	Responsible Use & Cyber-Security	• Students discuss basic issues related to responsible use of technology and information, consequences of inappropriate use, and examples of proper use in real life scenarios.	• Students discuss basic issues related to responsible use of technology and information, consequences of inappropriate use, and examples of proper use in real life scenarios.	• Students demonstrate understanding about proper exchange and sharing of information using digital systems and the importance of having humility, loyalty and respect for others when communicating.	• Students understand how to keep their personal information private when being online, exhibit awareness about the different threats when using online websites, and can make right decisions on what to share, when to share, and with whom.	• Students demonstrate understanding about proper exchange and sharing of information using digital systems and the importance of having humility, loyalty and respect for others when communicating.
	Impacts of Technology	• Students demonstrate knowledge of technology in everyday life.	• Students discuss how technology impacts humanity including how it affects education, culture.	• Students discuss how technology impacts humanity including how it affects education, culture.	• Students discuss how technology impacts humanity including how it affects education, culture.	• Students discuss how technology impacts humanity including how it affects education, culture.
	Information Accuracy & Reliability			• Students evaluate the accuracy, credibility, integrity, relevance, appropriateness, comprehensiveness, and biases of the different electronic information sources concerning real-world problems, aid in evaluating Inernet resources, and exhibit critical thinking skills to judge about what is right/wrong when using information taken from online sources.	• Students evaluate the accuracy, credibility, integrity, relevance, appropriateness, comprehensiveness, and biases of the different electronic information sources concerning real-world problems, aid in evaluating Inernet resources, and exhibit critical thinking skills to judge about what is right/wrong when using information taken from online sources.	• Students evaluate the accuracy, credibility, integrity, relevance, appropriateness, comprehensiveness, and biases of the different electronic information sources concerning real-world problems, aid in evaluating Internet resources, and exhibit critical thinking skills to judge about what is right/wrong when using information taken from online sources.
	Cyber Ethics & Laws			• Students develop understanding about the privilege of using electronic information as well as the right to having equal, secure and reliable access.	• Students discuss ideas implemented in technology that support people with special needs.	• Students discuss ideas implemented in technology that support people with special needs.
	Cyber Health	• Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them.	• Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them.	• Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them.	• Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them.	• Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them.

Scope and Sequence
Domains, Strands and Standards by Grade

Grade: 1				
Domain	Strand	Standards	Learning outcomes	Integration
4. Cyber Security, Cyber Safety, and Cyber Ethics	(4.1) Responsible Use & Cyber-Security	(4.1.1) Students discuss basic issues related to responsible use of technology and information, consequences of inappropriate use, and examples of proper use in real life scenarios	(G1.4.1.1.1) Realize the importance of referring to parent and guardians when using new technology	Common Sense Education(How technology make you feel-)
			(G1.4.1.1.2) Discuss why it is important to be responsible when using technology	ommon Sense ducation(Pause and hink Online)
			(G1.4.1.1.3) List main consequences of improper use of technology and how to avoid them	Canva poster(Use of Technology-Causes and Solution)
	(4.2) Impacts of Technology	(4.2.1) Students demonstrate knowledge of technology in everyday life	(G1.4.2.1.1) List common technologies used in everyday life	Word/Powerpoint(Type sentences and insert pictures of different technology)
	(4.5) Cyber Health	(4.5.1) Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them	(G1.4.5.1.1) Explain how prolong use of computers can cause back pain and eyestrain and how to avoid it	Canva poster/Powerpoint(Use of Technology-Causes and Solution)

Grade: 2				
Domain	Strand	Standards	Learning outcomes	Integration
	(4.1) Responsible Use & Cyber-Security	(4.1.1) Students discuss basic issues related to responsible use of technology and information, consequences of inappropriate use, and examples of proper use in real life scenarios	(G2.4.1.1.1) Discuss the purpose of using passwords using real life examples	Password Security **(Linked to Common sense media)**
			(G2.4.1.1.2) Demonstrate responsible use of the school network bandwidth and public services	

4. Cyber Security, Cyber Safety, and Cyber Ethics			(G2.4.1.1.3) Practice responsible digital citizenship in the use of technology systems and software	We, The Digital Citizens **(Linked to Common sense media)**
	(4.2) Impacts of Technology	(4.2.2) Students discuss how technology impacts humanity including how it affects education, culture, the workplace, and business	(G2.4.2.2.1) List ways in which people use computers at work and in their daily lives	That's Private and Digital Trails **(Linked to Common sense media)**
	(4.5) Cyber Health	(4.5.1) Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them	(G2.4.5.1.1) Describe the concept of "Ergonomics" and its importance	Device free moments, Putting a STOP to online meanness **(Linked to Common sense media)**

Grade: 3				
Domain	Strand	Standards	Learning outcomes	Integration
4. Cyber Security, Cyber Safety, and Cyber Ethics	(4.1) Responsible Use & Cyber-Security	(4.1.2) Students demonstrate understanding about proper exchange and sharing of information using digital systems and the importance of having humility, loyalty and respect for others when communicating	(G3.4.1.2.1) Discuss basic ethical and unethical behaviors in the digital world	Super Digital Citizen lesson from Commonsense Media
			(G3.4.1.2.2) Discuss how to use modern digital communication and collaboration tools and devices appropriately and responsibly	Our Digital Citizenship Pledge from Commonsense Media
			(G3.4.1.2.3) Create a good password to protect personal data	Password Power up lesson from Commonsense Media
	(4.2) Impacts of Technology	(4.2.2) Students discuss how technology impacts humanity including how it affects education, culture, the workplace, and business	(G3.4.2.2.1) List different technologies that are used in different professions in their typical work environment	
	(4.3) Information Accuracy & Reliability	(4.3.1) Students evaluate the accuracy, credibility, integrity, relevance, appropriateness, comprehensiveness, and biases of the different electronic information sources concerning real-world problems, aid in evaluating Inernet resources, and exhibit critical thinking skills to judge about what is right/wrong when using information taken from online sources	(G3.4.3.1.1) Realize that no one should assume that information on the Internet is accurate, timely, clear, and important	Is seeing believing lesson from Commonsense Media

	(4.4) Cyber Ethics & Laws	(4.4.1) Students develop understanding about the privilege of using electronic information as well as the right to having equal, secure and reliable access	(G3.4.4.1.1) Explain different ways one can instill the right attitude when using the facilities made available by the public	Your rings of responsibility lesson from Commonsense Media
	(4.5) Cyber Health	(4.5.1) Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them	(G3.4.5.1.1) Explain how some computer usage practices can affect physical health and the best ways to protect oneself from such harm	The Power of words lesson from Commonsense Media

Grade: 4				
Domain	Strand	Standards	Learning outcomes	Integration
4. Cyber Security, Cyber Safety, and Cyber Ethics	(4.1) Responsible Use & Cyber-Security	(4.1.3) Students understand how to keep their personal information private when being online, exhibit awareness about the different threats when using online websites, and can make right decisions on what to share, when to share, and with whom	(G4.4.1.3.1) Identify personal information	
			(G4.4.1.3.2) Exhibit right judgments when sharing personal information	Create a Powerpoint presentation on Private and Personal Information. **(Linked to Common sense media)**
			(G4.4.1.3.3) Identify possible risks, dangers, as well as advantages of making friendships & relationships online	COMMON SENSE EDUCATION: Private and Personal Information
	(4.2) Impacts of Technology	(4.2.2) Students discuss how technology impacts humanity including how it affects education, culture, the workplace, and business	(G4.4.2.2.1) Demonstrate understating of technological innovation and how technology is fast changing in our modern world	
	(4.3) Information Accuracy & Reliability	(4.3.1) Students evaluate the accuracy, credibility, integrity, relevance, appropriateness, comprehensiveness, and biases of the different electronic information sources concerning real-world problems, aid in evaluating Inernet resources, and exhibit critical thinking skills to judge about what is right/wrong when using information taken from online sources	(G4.4.3.1.1) Discuss why information should be checked for accuracy on a web page	Create a movie Information. **(Linked to Common sense media)** COMMON SENSE EDUCATION: A Creator's Rights and Responsibilities

	(4.4) Cyber Ethics & Laws	(4.4.2) Students discuss ideas implemented in technology that support people with special needs	(G4.4.4.2.1) Explain how technology helps people with physical challenges and how they can improve their access to technology in the future	COMMON SENSE EDUCATION: Keeping games fun & healthy Scratch coding to create games for their classmates.
			(G4.4.4.2.2) Describe the role that adaptive technology can play in the lives of people with special needs	
	(4.5) Cyber Health	(4.5.1) Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them	(G4.4.5.1.1) Discuss Symptoms of Internet Addiction	COMMON SENSE EDUCATION: My Media Choices

Grade: 5				
Domain	Strand	Standards	Learning outcomes	Integration
4. Cyber Security, Cyber Safety, and Cyber Ethics	(4.1) Responsible Use & Cyber-Security	(4.1.2) Students demonstrate understanding about proper exchange and sharing of information using digital systems and the importance of having humility, loyalty and respect for others when communicating	(G5.4.1.2.1) Explain how technology can be misused by comparing appropriate and inappropriate social networking behaviors	Create a poster in CANVA to create an awareness of Social networking. **(Linked to Common sense media)**
			(G5.4.1.2.2) Exhibit legal and ethical behaviors when using information and technology	Create a poster in CANVA for Dos and Don't's of Social networking. **(Linked to Common sense media)**
			(G5.4.1.2.3) Discuss the consequences of misusing information and technology	Create flip grid video to create awareness on sharing information in online **(Linked to Common sense media)**
	(4.2) Impacts of Technology	(4.2.2) Students discuss how technology impacts humanity including how it affects education, culture, the workplace, and business	(G5.4.2.2.1) Evaluate different applications according to ease of use for specific type of user	Discuss the advantages and disadvantages of different applications. Do a mindmap using Mindmup **(Linked to Common sense media)**

	(4.3) Information Accuracy & Reliability	(4.3.1) Students evaluate the accuracy, credibility, integrity, relevance, appropriateness, comprehensiveness, and biases of the different electronic information sources concerning real-world problems, aid in evaluating Inernet resources, and exhibit critical thinking skills to judge about what is right/wrong when using information taken from online sources	(G5.4.3.1.1) Discuss common techniques used to identify fake websites	
	(4.4) Cyber Ethics & Laws	(4.4.2) Students discuss ideas implemented in technology that support people with special needs	(G5.4.4.2.1) Discuss how technology makes it easier to engage students with physical and learning disabilities	Create a video on how technology helped in education during pandemic. **(Linked to Common sense media)**
			(G5.4.4.2.2) Discuss common examples of added features or functionalities of technologies that would support usage by people with special needs	
	(4.5) Cyber Health	(4.5.1) Students develop understanding about physical and psychological well-being in a digital world and the consequences of improper technology usage practices and the best ways to avoid them	(G5.4.5.1.1) Identify Social Problems Associated with Computer and Internet Use	Create an animated movie on social problems on internet use.
			(G5.4.5.1.2) Setup the workplace for proper posture, appropriate distance from monitors and having proper lighting	Create a poster to depict wellbeing of digital world. **SDG:3 Good Health and Wellbeing**

Student Performance Criteria

Grade 1				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Cyber Security, Cyber Safety, and Cyber Ethics	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Responsible Use & Cyber-Security	• discuss the importance of responsible use of technology but with lots of hesitation and/or lots of mistakes.	• incompletely discuss the importance of responsible use of technology and can list few consequences of improper use and ways to avoid it.	• discuss the importance of responsible use of technology using adequate supporting details and explain some of the consequences of improper use and ways to avoid it.	• discuss the importance of responsible use of technology using many supporting details and explain many of the consequences of improper use and ways to avoid it.
Impacts of Technology	• list limited common technologies used in everyday life with a lot of mistakes.	• list some common technologies used in everyday life with some mistakes.	• list most of the common technologies used in everyday life.	• list common technologies used in everyday life.
Information Accuracy & Reliability	• define "reliable online sources" with lots of hesitation and lots of mistakes.	• give somewhat incomplete definition about "reliable online sources".	• give a sufficient definition about "reliable online sources" but does not elaborate or include details.	• give an appropriate definition about "reliable online sources" where many important details are included.
Cyber Health	• describe limited aspects of how prolong use of computers can cause back pain and eyestrain with hesitation.	• describe some aspects of how prolong use of computers can cause back pain and eyestrain and how to avoid it.	• explain how prolong use of computers can cause back pain and eyestrain and how to avoid it with some incorrect terminology.	• explain flawlessly how prolong use of computers can cause back pain and eyestrain and how to avoid it.

Grade 2				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Cyber Security, Cyber Safety, and Cyber Ethics	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Responsible Use & Cyber-Security	• discuss responsible digital citizenship in the use of technology systems and software but with lots of hesitation and lots of mistakes. • discuss the purpose of using passwords but with limited details and without confidence.	• discuss responsible digital citizenship in the use of technology systems and software using incomplete details. • discuss the purpose of using passwords with limited details but with some confidence.	• discuss responsible digital citizenship in the use of technology systems and software using adequate supporting details. • discuss the purpose of using passwords using adequate supporting details.	• discuss responsible digital citizenship in the use of technology systems and software using many supporting details. • discuss the purpose of using passwords with elaboration and effective use of real-life examples.

Impacts of Technology	• recall with help ways in which people use computers at work and in their daily lives.	• list some examples in which people use computers at work and in their daily lives satisfactorily.	• list most of the ways in which people use computers at work and in their daily lives.	• list perfectly ways in which people use computers at work and in their daily lives.
Information Accuracy & Reliability	• Explain the difference between reliable and unreliable online sources with lots of hesitation and lots of mistakes.	• discuss the difference between reliable and unreliable online sources using incomplete details.	• discuss the difference between reliable and unreliable online sources using some details but fails to elaborate.	• discuss the difference between reliable and unreliable online sources with elaboration and using many supporting details.
Cyber Health	• describe the concept of "Ergonomics" with help.	• describe the concept of "Ergonomics" and its importance with some errors.	• describe the concept of "Ergonomics", its importance with some incorrect terminology.	• describe perfectly the concept of "Ergonomics", its importance.

Grade 3				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Cyber Security, Cyber Safety, and Cyber Ethics	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Responsible Use & Cyber-Security	• discuss the basic ethical and unethical behaviors in the digital world but with lots of hesitation and lots of mistakes. • create a password to protect personal data with a lot of help from the teacher.	• discuss the basic ethical and unethical behaviors in the digital world and how to use modern digital communication and collaboration tools and devices appropriately and responsibly but, however, the used details are incomplete. • create an acceptable password to protect personal data but with some difficulty.	• discuss basic ethical and unethical behaviors in the digital world and how to use modern digital communication and collaboration tools and devices appropriately and responsibly using adequate supporting details. • create a good password to protect personal data with little help from the teacher.	• discuss basic ethical and unethical behaviors in the digital world and how to use modern digital communication and collaboration tools and devices appropriately and responsibly using many important supporting details. • create a strong password to protect personal data with no help.
Impacts of Technology	• recall a technology that is used in a profession in its typical work environment with help.	• list some technologies that are used in different professions in their typical work environment.	• list most of the different technologies that are used in different professions in their typical work environment.	• list faultlessly different technologies that are used in different professions in their typical work environment.
Information Accuracy & Reliability	• Identify fake websites with difficulty.	• Identify few aspects of fake websites with little accuracy.	• Identify some aspects of fake websites with adequate accuracy.	• Identify aspects of fake websites accurately.
Cyber Ethics & Laws	• demonstrate unsatisfactory level of understanding about the different ways one can instill the right attitude when using the facilities made available by the public.	• discuss different ways one can instill the right attitude when using the facilities made available by the public using little supporting details.	• discuss different ways one can instill the right attitude when using the facilities made available by the public using adequate supporting details.	• discuss different ways one can instill the right attitude when using the facilities made available by the public clearly and with elaboration.
Cyber Health	• recall a computer usage practice that can affect physical health with assistance.	• describe how some computer usage practices can affect physical health with incorrect terminology.	• explain how computer usage practices can affect physical health and also some ways to protect oneself from such harm.	• explain how computer usage practices can affect physical health and the best ways to protect oneself from such harm.

Grade 4				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Cyber Security, Cyber Safety, and Cyber Ethics	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Responsible Use & Cyber-Security	• discuss matters related to personal information using limited details and exhibit inaccurate judgments when sharing personal information online.	• discuss issues related to personal information using little details and exhibit inaccurate judgments when sharing personal information.	• discuss issues related to personal information using adequate important details and exhibit judgments when sharing personal information online.	• discuss issues related to personal information using many important details and exhibit judgments when sharing personal information online.
Impacts of Technology	• list an example of technological innovation with help.	• list some examples of technological innovation.	• list examples of technological innovation and some aspects of how technology is fast changing in our modern world.	• analyze technological innovation and predict the effect of technology is fast pace of change on our modern world.
Information Accuracy & Reliability	• discuss "information reliability" in specific contexts with a lot of hesitation.	• discuss "information reliability" in specific contexts with a some hesitation.	• discuss "information reliability" in specific contexts with confidence using adequate supporting details.	• discuss "information reliability" in specific contexts with confidence using many important supporting details.
Cyber Ethics & Laws	• explain how technology helps people with special needs in their lives and how they can improve their access to technology in the future but with lots of hesitation and difficulty.	• explain how technology helps people with special needs in their lives and how they can improve their access to technology in the future but with some hesitation and some mistakes.	• explain how technology helps people with special needs in their lives and how they can improve their access to technology in the future with confidence and using adequate supporting details.	• explain how technology helps people with special needs in their lives and how they can improve their access to technology in the future with confidence and using many important supporting details.
Cyber Health	• Recall a symptom of Internet addiction with assistance.	• list limited symptoms of Internet addiction with use of incorrect terminology.	• discuss most symptoms of Internet addiction.	• discuss perfectly symptoms of Internet addiction.

Grade 5				
Student	1-Barely or not initiated	2-Under development	3-Satisfies expectations	4-Exceeds expectations
Domain Cyber Security, Cyber Safety, and Cyber Ethics	A (Level 1) Student may be able to:	A (Level 2) Student is able to:	A (Level 3) Student is able to:	A (Level 4) Student is able to:
Responsible Use & Cyber-Security	• discuss technology misuse and its consequences with lots of hesitation and incorrect details.	• discuss technology misuse and its consequences by comparing appropriate and inappropriate social networking behaviors with some hesitation and using few details.	• discuss technology misuse and its consequences by comparing appropriate and inappropriate social networking behaviors and how to exhibit legal and ethical behaviors when using information and technology using adequate support details.	• discuss technology misuse and its consequences by comparing appropriate and inappropriate social networking behaviors and how to exhibit legal and ethical behaviors when using information and technology using many supporting details.
Impacts of Technology	• recall with assistance an application that can provide ease of use for specific type of user.	• list some applications according to ease of use for specific type of user.	• evaluate incorrectly different applications according to ease of use for specific type of user and is able to setup the workplace for proper posture.	• evaluate different applications according to ease of use for specific type of user and is able to design and setup the workplace for proper posture, appropriate distance from monitors and having proper lighting.
Information Accuracy & Reliability	• discuss content theft detection and best methods for prevention with lots of hesitation and inaccurate details.	• discuss content theft detection and best methods for prevention with some hesitation using limited details.	• discuss content theft detection and best methods for prevention using adequate details.	• discuss content theft detection and best methods for prevention using many supporting details.
Cyber Ethics & Laws	• explain how technology and added special features to software make it easier to engage students with physical and learning disabilities but with lots of hesitation and incorrect details.	• explain how technology and added special features to software make it easier to engage students with physical and learning disabilities with some hesitation using limited details.	• explain how technology and added special features to software make it easier to engage students with physical and learning disabilities using adequate details.	• explain how technology and added special features to software make it easier to engage students with physical and learning disabilities using many supporting details.
Cyber Health	• list an example of a social problem associated with Computer and Internet use with inaccuracies.	• list some examples of social problems associated with Computer and Internet use with errors.	• identify most social problems associated with Computer and Internet use.	• identify perfectly social problems associated with Computer and Internet use.

List of Software Requirements:

Learning Resources for Digital Literacy

Grade1	Grade2	Grade3	Grade4	Grade 5
• MS Windows • Microsoft Word • Microsoft PowerPoint • Microsoft Excel • Rapid Typing • Microsoft Paint • Tux Paint • Google chrome	• Microsoft Windows • Microsoft Paint • Tux Paint • Microsoft Word • Microsoft Powerpoint • Tux Math • Microsoft Excel	• MS Windows • MS Paint • Tux Paint • MS Word • Scratch • MS Excel • MS PowerPoint	• MS Windows • Microsoft Word • Tux Paint • Microsoft PowerPoint • Scratch Programming • Microsoft Excel • Internet Browsers	• MS Windows • Microsoft Edge • Microsoft Word • Microsoft PowerPoint • Microsoft Excel • Scratch Programming • Internet and Email

Learning Resources for Programming

Grade	Software / Hardware	Professional Development
Grade1	• StoryJumper • Code.org • Kudo • StoryboardThat • Tynker • Augmented Reality • Rapid Typing • Keyboard skills-Vocabulary.co.il • MS-Paint • Tux Paint • Canva	• Common Sense Education • Class Management Tools-Class 123 • Augmented Reality Apps-3D Viewer/ARLOOPA • Sway
Grade 2	• Code.org & Blockly Games • Tynker & Scratch 3.0 • Storyboard that & Storyjumper • ABCYA animate • Keyboarding skills – Vocabulary.co.il • Tux paint & Ms Paint • Mindmap tools • Augmented Reality app – ARLOOPA / 3D viewer • CoSpaces • Sway	• Augmented Reality apps – ARLOOPA / 3D viewer • Class Dojo/Class 123 • Pixton • Padlet/Linoit • Nearpod • Common sense media education • Class kick • CoSpaces • Sway • Canva/SlidesGo
Grade 3	• Tynker • ABCYA.com • Scratch 3.0 • Canva for Education • Mind mup • Pixton • Class Kick • Augmented Reality • 3D Viewer • Keyboard Skills – Vocabulary.co.il	• Hour of Code • Common Sense Education • Class 123 or Class Dojo • Bouncy Balls • Sway and PPT
Grade 4	• Keyboard Skills – Vocabulary.co.il • Code.org/blockly games • Scratch • Canva	• Ayoa • Slidesgo • Augmented Reality app – ARLOOPA / 3D viewer

	• Windows Movie Maker • Mind map • Augmented Reality • 3D viewer • Storyboard That • Sway	• Class Dojo/Class 123 • Common Sense Media Digital Curriculum • Pear Deck • Sway
Grade 5	• Scratch 3.0 • Canva for Education • Windows Movie Maker • 3D Viewer • Tinker Cad • Sway • Thunkable • Keyboard Skills – Vocabulary.co.il • Book creator, Code Spark, storybird. • Class kick • Augmented Reality • Mind Map tool:coggle.it • Flip grid • Pictoblox • Linoit	• Hour of code • Common sense education- Digital citizenship • Class room Management web tools - Class dojo, Class 123 • Code.org • Pear deck • Sway • Flip grid

References

Useful Sites

1. MySecureCyberspace: https://www.mysecurecyberspace.com/
2. NASCIO: http://nascio.org/
3. National Center for Victims of Crime: http://www.ncvc.org/
4. National Crime Prevention Council: http://www.ncpc.org/
5. National Institute of Standards and Technology (NIST): http://www.nist.gov/information-technology-portal.cfm
6. National Initiative for Cybersecurity Education (NICE): http://csrc.nist.gov/nice/
7. NetSmartz: http://www.netsmartz.org/index.aspx
8. NYS Division of Homeland Security and Emergency Services' Office of Cyber Security: http://www.dhses.ny.gov/ocs
9. PointSmartClickSafe: http://www.pointsmartclicksafe.org/
10. Savvy Cyber Kids: http://savvycyberkids.org/
11. WiredSafety.org: http://www.stopcyberbullying.org/
12. Yahoo!: Teaching Children About Online Risks: http://elearnmap.ipgkti.edu.my/resource/edu3053/artikel/Teaching+Children+About+Online+Risks. htm
13. Google for Education:https://www.google.com/edu/programs/exploring-computational-thinking/index.html#!lessons-and-examples
14. http://www.brighthub.com/computing/windows-platform/articles/6469.aspx
15. http://www.palmbeachschools.org/multicultural/documents/Chapter2ProgramModels.pdf
16. http://www.iste.org/
17. http://ritter.tea.state.tx.us/rules/tac/ch126.html
18. http://csta.acm.org/
19. http://www.cs4hs.com/
20. http://code.org/
21. http://hourofcode.com/us
22. http://scratch.mit.edu/
23. https://css-cs4hs.appspot.com/CS4HS2013/course
24. https://creative-computing.appspot.com/preview
25. http://www.cs4hs.com/resources/cscs.html
26. http://www.csprinciples.org/
27. http://csedweek.org/
28. http://www.exploringcs.org/
29. http://www.appinventor.org/
30. http://gamesalad.com/
31. http://code.google.com/p/blockly/
32. http://www.scratchjr.org/
33. http://csunplugged.org/