“Whether we're fighting climate change or going to space, everything is moved forward by computers, and we don't have enough people who can code. Teaching young people to code early on can help build skills and confidence and energize the classroom with learning-by-doing opportunities. I learned how to fly a hot air balloon when I was 30,000 feet up and my life was in the balance: you can learn skills at any age but why wait when we can teach everyone to code now!”

Richard Branson

Founder, Virgin Group

# Vision

***The abilities to effectively use and create technology to solve complex problems are the new and essential literacy skills of the twenty-first century.***

# Overview

The Digital Literacy and Computer Science (DLCS) skills and knowledge articulate critical learning outcomes for Kindergarten through Grade 12 to help prepare students for success in world. The standards represent the core elements of digital literacy and computer science and are intended to drive coherent, rigorous instruction which results in the mastery and application of digital literacy and computer science knowledge, reasoning, and skills.

The purpose of this document is to introduce educators to the DLCS Framework by providing a general overview of the key skills and knowledge in Grade 6 to Grade 8.

# DLCS Skills and Knowledge

The goal for middle school students is to define problems more precisely, to conduct a more thorough process of selecting the best devices, tools, and solutions. Students learn to differentiate problems or sub-problems that are best solved by computing systems or digital tools and those best solved by humans. Students further develop their computational thinking problem solving skills, which facilitates the use of technology.

Grade 6 to 8 standards integrate all seven practices. Standards in this grade span ask students to demonstrate the ability to:

Computing and Society (CAS)

* Understand safety and security concepts, online identity and privacy, and how to deal with cyberbullying and inappropriate content.
* Demonstrate responsible use of technology and laws regarding ownership of material/ideas, licensing, and fair use.
* Understand consequences of inappropriate technology use, including harassment and sexting.
* Examine the impact of emerging technology in schools, communities, and societies.
* Evaluate digital media bias and messaging.

Digital Tools and Collaboration (DTC)

* Use a variety of digital tools to create artifacts, online content, and online surveys.
* Understand that different digital tools have different uses.
* Communicate and publish online.
* Advance research skills.

Computing Systems CS)

* Understand hardware and software components of a computing device; troubleshoot hardware and software problems.
* Use a variety of computing devices to manipulate data.
* Differentiate tasks/problems best solved by computing systems or by humans.
* Understand that network components carry out specific functions to connect computing devices, people, and services.
* Understand the capabilities services can provide.

Computational Thinking (CT)

* Create a new representation, define functions, and use decomposition.
* Write, debug, and analyze advanced algorithms and basic programs.
* Understand how computing devices represent and manipulate information.
* Create, modify, and manipulate databases.
* Use a variety of data collection devices.
* Create a model and use and modify a simulation for analysis.

By the time students reach middle school, they should have had numerous experiences in using technology to create artifacts and solve problems. Active engagement of middle school students with the practices is critical: students generally make up their minds about whether they identify with science and engineering by the time they leave grade 8. Students should have opportunities to develop the skills necessary for a meaningful progression of development in order to engage in reasoning, which is critical to success in civic life, post-secondary education, and career.

**Resources**

DLCS Resources – <http://www.doe.mass.edu/stem/dlcs/>

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