

**NEW YORK STATE EDUCATION DEPARTMENT  
MIDDLE LEVEL CAREER AND TECHNICAL EDUCATION  
COMPUTER SCIENCE AND INFORMATION TECHNOLOGY  
COMPUTATIONAL THINKING CONTENT MODULE  
UPDATED MAY 2023**

## MODULE DESCRIPTION

Computational thinking involves posing and solving problems in ways that can be carried out by a computer. It includes concepts, such as algorithms and variables, and practices, such as abstraction, decomposition, data analysis, modeling, and simulation. These are vital not only to the design and development of computer programs, but also to the strategic use of computational power to solve problems across disciplines.

In this module, students will learn how to use computational thinking to solve problems. They will define and analyze problems by extracting details and repeatable patterns in collected data sets. Modeling and visualization techniques will be employed to assist in design, define needs, and make data more easily understood. Using iterative development, students will break larger problems into smaller, more manageable components. They will learn the fundamentals of writing algorithms, using variables and control flow statements with logical sequencing. Using algorithms, students will produce a solution in the form of pseudocode, flowcharts, or code.

## GUIDING QUESTION

What computational thinking concepts and practices can students use to solve problems?

## MODULE CONTENT

### 1. DECOMPOSITION AND ABSTRACTION

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**STUDENTS WILL:**

## 2. MODELING AND VISUALIZATION

- c) Assess personal employability skills for careers in computing and evaluate personal suitability for such careers

## ILLUSTRATIVE ACTIVITIES BY THEME MODULE

These activities are intended to serve as examples of how the content in this module could be tied to each of the six middle level themes.

### CAREER AND COMMUNITY OPPORTUNITIES

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## COMMON CAREER TECHNICAL CORE STANDARDS

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### CAREER READY PRACTICES

1. Act as a responsible and contributing citizen and employee
2. Apply appropriate academic and technical skills
3. Attend to personal health and financial well-being
4. Communicate clearly and effectively with reason
5. Consider the environmental, social, and economic impacts of decisions
6. Demonstrate creativity and innovation
7. Employ valid and reliable research strategies
8. Utilize critical thinking to make sense of problems and persevere in solving them
9. Model integrity, ethical leadership, and effective management

4. Attend to personal health and financial well-being



## NYS COMPUTER SCIENCE AND DIGITAL FLUENCY (CS&DF) LEARNING STANDARDS

<http://www.nysed.gov/curriculum-instruction/computer-science-and-digital-fluency-learning-standards>