INDIANA DEPARTMENT of EDUCATION

# 2024 INDIANA CONTENT CONNECTORS

## COMPUTER SCIENCE

## GRADES 6-8

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# Indiana Content Connectors Context and Purpose

## Introduction

The Indiana Content Connectors for Grades 6-8 Computer Science are the result of a process designed to identify, evaluate, synthesize, and create high-quality learning expectations for Indiana students with significant cognitive disabilities.

The Indiana Department of Education (IDOE) convened stakeholder committees to review proposed revisions to Indiana's Alternative Standards, known as content connectors. The content connectors are designed to measure the knowledge and skills of students with the most significant cognitive disabilities and are assessed with the state's alternate assessment. The content connectors are designed to ensure that all Indiana students in this population are prepared with essential knowledge and skills needed to access employment, enrollment, or enlistment leading to service.

## What are the Content Connectors and how should they be used?

The Indiana Content Connectors are designed to help educators, parents, students, and community members understand the necessary content for each grade level, and within each content area domain, to access employment, enrollment, or enlistment leading to service. These content connectors should form the basis for strong core instruction for all students at each grade level and content area. The content connectors identify the minimum academic content or skills to which Indiana students need access in order to be prepared for success after graduation, but they are not an exhaustive list.

While the Indiana Content Connectors establish key expectations for knowledge and skills and should be used as the basis for curriculum, the content connectors by themselves do not constitute a curriculum. It is the responsibility of the local school corporation to select and formally adopt curricular tools, including textbooks and any other supplementary materials, that align with Indiana Content Connectors. Additionally, corporation and school leaders should consider the appropriate instructional sequence of the content connectors as well as the length of time needed to teach each one. Every content connector has a unique place in the continuum of learning, but each content connector will not require the same amount of time and attention. A deep understanding of the vertical articulation of the standards will enable educators to make the best instructional decisions. These content connectors must also be complemented by robust, evidence-based instructional practices to support overall student development. By utilizing strategic and intentional instructional practices, other areas such as STEM and employability skills can be integrated with the content connectors.

## Acknowledgments

IDOE appreciates the time, dedication, and expertise offered by Indiana's K-12 general and special educators, higher education professors, representatives from business and industry, families, and other stakeholders who contributed to the development of the Indiana Content Connectors. We wish to specially acknowledge the committee members, as well as participants in the public comment period, who dedicated many hours to the review and evaluation of these content connectors designed to prepare Indiana students for success after graduation.

## Grades 6-8 Computer Science

*Standards and content connectors identified as essential for mastery by the end of the grade level are indicated with gray shading and an "E." Empty boxes are placeholders to preserve alignment of vertically-articulated standards.*

| Indiana Academic Standards | Content Connectors |
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| **Data & Information** | |
| **6-8.DI.1:** Decompose (i.e., break down) problems into smaller, more manageable subsets by applying the algorithmic problem solving steps to make the possible solutions easier to follow, test, and debug. (E) | **6-8.DI.1a:** Decompose a problem into steps to test possible solutions. (E) |
| **6-8.DI.2:** Collect data using computational tools (e.g., sensors, inputs like microphones) and transform the data to make it more useful and reliable. | **6-8.DI.2a:** Analyze collected data and identify a way to make it more useful (e.g., after listening to responses recorded by a microphone, or reading the closed captioning, decide if the responses should be re-recorded to make them clearer). |
| **6-8.DI.3:** Describe that data can be represented in multiple encoding schemes such as binary, RGB values (e.g., red, green, and blue intensity), and hexadecimal codes. | **6-8.DI.3a:** Describe that data can be represented in different ways (binary, RGB values [e.g., red, green, and blue intensity], and hexadecimal codes) for the computer to process the information. |
| **6-8.DI.4:** Create visuals such as flowcharts, diagrams, and pseudocode to represent complex problems as algorithms. (E) | **6-8.DI.4a:** Use visuals (e.g., flowcharts, diagrams, charts) to plan, interpret, break down, or solve a problem. (E) |
| **Computing Devices & Systems** | |
| **6-8.CD.1:** Design projects that combine hardware and software components to collect and exchange data. (E) | **6-8.CD.1a:** Identify and use the hardware and software components of a system to complete a task. (E) |
| **6-8.CD.2:** Systematically identify and fix problems (i.e., troubleshoot) with computing devices and their components (e.g., checklist, decision tree, flowchart). | **6-8.CD.2a**: Use provided strategies (e.g., checklist, decision tree, flowchart) to identify or fix problems with provided technology. |

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| **6-8.CD.3:** Recommend improvements to the design of computing devices based on analysis of how users interact with the devices. (E) | **6-8.CD.3a:** Recommend one improvement to the design or functionality of hardware or software based on personal experience. |
| **6-8.CD.4:** Describe what distinguishes humans from machines, focusing on ways we can communicate, as well as ways in which computers use models of intelligent behavior (e.g., robot motion, speech and language understanding, computer vision). | **6-8.CD.4a:** Identify what distinguishes human communication from machine communication. |
| **Programs & Algorithms** | |
| **6-8.PA.1:** Design and iteratively develop programs that combine the following: sequencing, looping (including nested loops), conditionals (including compound conditionals), expressions, variables, functions, and parameters. (E) | **6-8.PA.1a:** Iteratively design a simple sequence to complete a process or address a problem. |
| **6-8.PA.2:** Systematically test and refine programs using a range of test cases. (E) | **6-8.PA.2a:** Use a provided systematic approach to test and refine a program. (E) |
| **6-8.PA.3:** Incorporate existing code, media, and libraries into original programs and give attribution. | **6-8.PA.3a:** Add information (e.g., code, media, and libraries) to an original program to produce a desired outcome and give credit to the source. |
| **6-8.PA.4:** Document programs in order to make them easier to follow, test, and debug. | **6-8.PA.4a:** Describe what a line of code does in a simple familiar program. |
| **Networking & the Internet** | |
| **6-8.NI.1:** Explain how physical and cybersecurity measures protect electronic information. (E) | **6-8.NI.1a:** Identify one or more ways to protect electronic information. (E) |
| **6-8.NI.2:** Model the role of protocols in transmitting data across networks and the internet. (E) | **6-8.NI.2a:** Model how data is transmitted (protocols) across networks and the internet. |
| **6-8.NI.3:** Apply multiple methods of encryption to model the secure transmission of information. | **6-8.NI.3a:** List ways to protect information transmitted across networks and the internet. |

| Impact & Culture | |
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| **6-8.IC.1:** Exhibit legal and ethical behaviors when using technology and information and discuss the consequences of misuse. (E) | **6-8.IC.1a:** Demonstrate responsible behavior when using hardware and software and discuss the consequences of misuse. (E) |
| **6-8.IC.2:** Discuss issues of bias and accessibility in the design of existing technologies. | **6-8.IC.2a:** Make observations regarding, or identify issues of, bias and accessibility with hardware and software/technology. |
| **6-8.IC.3:** Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. | **6-8.IC.3a:** Create an artifact with a partner or small group using provided criteria, constraints, or design preferences from stakeholders. |
| **6-8.IC.4:** Describe tradeoffs between allowing information to be public and keeping information private and secure. | **6-8.IC.4a:** Compare tradeoffs between allowing information to be public and keeping information private and secure. |
| **6-8.IC.5:** Discuss how unequal distribution and participation in technology and computer science disadvantages marginalized populations. | **6-8.IC.5a:** Examine how unequal availability of technology has disadvantaged people who are in marginalized populations. |