Indiana CTE Next Level Programs of Study

Introduction to Computer Science

Computer Science	a	Students create an understanding of computer science and explore how it impacts their everyday lives. 483.D1.1
	b	Create a definition of computer science and computational thinking. 4803.D1.2
	c	Demonstrate awareness of the history of computing. 4803.D1.3
	d	Investigate trends in computer science and their impact on society. 4803.D1.4
	e	Summarize ethical issues within computer science. 4803.D1.5
Programming and Development	a	Students connect the process of developing a computing artifact (ex. computer application, web application, operating system, artificial intelligence) with the skills needed during the development process to have a better understanding of what it takes to build a computing artifact. 4803.D2.1
	b	Use the design process to iteratively develop a computing artifact. 4803.D2.2
	c	Demonstrate competencies of programming constructs, including use of data types and variables, control structures (sequencing, looping, branching), and modularity (such as a function). 4803.D2.3
	d	Understand how abstractions hide implementation details when used in everyday objects. 4803.D2.4
	e	Use abstraction to manage program complexity (such as a function to create recallable code). 4803.D2.5
	f	Formulate algorithms using programming structures to decompose a complex problem. 4803.D2.6
	g	Assess a program by testing to verify correct behavior. 4803.D2.7
	h	Construct a computing artifact that has a user interface. 4803.D2.8
	i	Produce an artifact that includes rich media. 4803.D2.9
	j	Illustrate knowledge of good programming practice including the use of conventional standards and comments. 4803.D2.10

Data	**a**	**Students describe the types of data and how it is created, stored, and used by computers.** 4803.D3.1
	b	**Understand how computers represent data, including: text, sound, images, and numbers.** 4803.D3.2
	c	**Create data visualizations, models, and simulations.** 4803.D3.3
	d	**Evaluate data to better understand the world.** 4803.D3.4
	e	**Explore the relationship between information and data.** 4803.D3.5
Computers, Devices, and Other Technologies	**a**	**Students analyze computer devices and other technologies to build an understanding of their impact on society and how to use them appropriately.** 4803.D4.1
	b	**Demonstrate understanding of the hardware and operating systems of computers.** 4803.D4.2
	c	**Discuss the ethical and appropriate use of computer devices.** 4803.D4.3
	d	**Explore the fundamental principles and components of computer networking.** 4803.D4.4
	e	**Examine the impact of the Internet on society.** 4803.D4.5
	f	**Investigate the use of artificial intelligence by individuals and society.** 4803.D4.6
	g	**Investigate innovations in computing, including robotics.** 4803.D4.7
Collaboration	**a**	**Students collaborate to complete various tasks.** 4803.D5.1
	b	**Design a solution to a problem by working in a team.** 4803.D5.2
	c	**Explore technologies that can be used to collaborate with others of various cultures and career fields.** 4803.D5.3
	d	**Utilize a problem-solving approach to develop a solution using technology.** 4803.D5.4
	e	**Analyze the work of peers and provide feedback.** 4803.D5.5
	f	**Program a solution to a problem using pair programming or other methods.** 4803.D5.6
Security and Privacy	**a**	**Examine the dynamic between privacy and security.** 4803.D6.1

	b Explain the privacy concerns related to the collection and generation of data through implicit and explicit processes. 4803.D6.2
	c Evaluate the social and emotional implications of privacy in the context of safety, law, and ethics. 4803.D6.3
	d Give examples to illustrate how sensitive data can be affected by malware and other attacks. 4803.D6.4
	e Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical implications. 4803.D6.5
	f Discuss the laws surrounding intellectual property. 4803.D6.6
Careers	**a** Students will investigate various careers within the field of computer science. 4803.D7.1
	b Identify computer science occupations and the roles and responsibilities of each. 4803.D7.2
	c Report job outlook, demand, and projected wages for computer science careers. 4803.D7.3
	d Explore the job opportunities that are available in computer science. 4803.D7.4
	e Investigate post-secondary training opportunities and industry certifications that are available. 4803.D7.5