Computer Science Resource Guide
Sixth – Eighth Grade

Data and Information		
Indiana Academic Standard	**Clarifying Statement(s)**	**Vocabulary**
6-8.DI.1 Use the basic steps in algorithmic problem-solving to design solutions (e.g., problem statement and exploration, examination of sample instances, design, implementing a solution, testing, and evaluation).		**algorithm** – a step-by-step process to complete a task
6-8.DI.2 Describe the process of parallelization as it relates to problem solving.	The problem is broken into discrete parts that can be solved concurrently. Each part is further broken down to a series of instructions. Example: --Calculations of numerical weather predications --Facial Recognition System that scans multiple facial features at the same time	**parallelization** - the use of two or more processors (cores, computers) in combination to solve a single problem
6-8.DI.3 Represent data in a variety of ways (e.g., text, sounds, pictures, and numbers), and use different visual representations of problems, structures, and data (e.g., graphs, charts, network diagrams, flowcharts).		**data** – information that is collected and used for reference or analysis. Data can be digital or non-digital and can be in many forms, including numbers, text, show of hands, images, sounds, or videos.

6-8.DI.4 Understand the notion of hierarchy and abstraction in computing including high-level languages, translation, instruction set, and logic circuits.	(1) Building things in hierarchies is very common in computer software. Example: File systems provided by operating systems. File systems have a top-level to subdirectories like "Program Files" and "Documents and Settings" and under these are more subdirectories. (2) Abstraction is a new representation of a thing, a system, or a problem that helpfully reframes a problem by hiding details irrelevant to the question at hand.	**abstraction** – the process of reducing complexity by focusing on the main idea. By hiding details irrelevant to the question at hand and bringing together related and useful details, abstraction reduces complexity and allows one to focus on the problem. **hierarchy** – an organizational structure in which items are ranked according to levels of importance
6-8.DI.5 Demonstrate interdisciplinary applications of computational thinking and interact with content-specific models and simulations to support learning and research.		**computational thinking** – 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, for example: a computer

Computing Devices and Systems		
Indiana Academic Standard	**Clarifying Statement(s)**	**Vocabulary**
6-8.CD.1 Demonstrate an understanding of the relationship between hardware and software.		**hardware** – the physical components that make up a computing system, computer, or computing device **software** – programs that run on a computer system, computer, or other computing device
6-8.CD.2 Apply troubleshooting strategies to identify and solve routine hardware and software problems that occur during everyday computer use.		**troubleshooting** – a systematic approach to problem solving that is often used to find and resolve a problem, error, or fault within software or a computer system

6-8.CD.3 Describe the major components and functions of computer systems and network.		**network** – a group of computing devices (personal computers, phones, servers, switches, routers, and so on) connected by cables or wireless media for the exchange of information and resources
6-8.CD.4 Describe what distinguishes humans from machines focusing on human intelligence versus machine intelligence and ways we can communicate, as well as ways in which computers use models of intelligent behavior (e.g., robot motion, speech and language understanding, and computer vision).		

Programs and Algorithms		
Indiana Academic Standard	**Clarifying Statement(s)**	**Vocabulary**
6-8.PA.1 Select appropriate tools and technology resources to support learning and personal productivity, publish individual products, and design, develop, and publish data, accomplish a variety of tasks, and solve problems.		
6-8.PA.2 Implement problem solutions using a programming language that includes looping behavior, conditional statements, logic, expressions, variables, and functions.		
6-8.PA.3 Demonstrate dispositions amenable to open-ended problem solving and programming (e.g., comfort with complexity, persistence, brainstorming, adaptability, patience, propensity to tinker, creativity, accepting challenge).		**programming** – the craft of analyzing problems and designing, writing, testing, and maintaining programs to solve them

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Networking and Communication		
Indiana Academic Standard	**Clarifying Statement(s)**	**Vocabulary**
6-8.NC.1 Collaboratively design, develop, publish, and present products (e.g., videos, podcasts, websites) using technology resources that demonstrate and communicate curriculum concepts.		**collaboratively** – to work, one with another
6-8.NC.2 Exhibit dispositions necessary for collaboration: providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization.		

Impact and Culture		
Indiana Academic Standard	**Clarifying Statement(s)**	**Vocabulary**
6-8.IC.1 Exhibit legal and ethical behaviors when using technology and information and discuss the consequences of misuse.		**digital citizenship** – the norms of appropriate, responsible behavior with regard to the use of technology
6-8.IC.2 Analyze the positive and negative impacts of technology on one's personal life, society, and our culture.		
6-8.IC.3 Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and biases that occur in electronic information sources.		**accuracy** – being correct and precise **relevance** – important to the matter at hand **appropriateness** – suitable or proper in the circumstances **comprehensiveness** – complete, including all or nearly all elements or aspects of something **bias** – prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered unfair

6-8.IC.4 Describe ethical issues that relate to computers and networks (e.g., security, privacy, ownership, and information sharing), and discuss how unequal distribution of technological resources in a global economy raises issues of equity, access, and power.		