

## Standards and Objectives for Computer Science Principles

1.0 Credits for Grades 9 - 12

Use the key below to help with acronyms used.

**JSP** – JavaScript Platform Game Design (Simply Coding's Course)

**ITW** – Intro to Web Programming (Simply Coding's Course)

Under the column labeled **Simply Coding Courses** we have listed the first or best instance where the task is encountered, explained and used by the students. However, throughout the course they will repeat and reuse these tasks many times as they complete their projects.

**Strand 1** – Creating interesting and relevant artifacts with tools and techniques of CS.

Standard	Task	Simply Coding Courses
Standard 1 - Computing fosters the creation of artifacts.	Use computing tools and techniques to create artifacts.	JSP Lesson 1: 1.3
	Collaborate in the creation of computational artifacts.	JSP Lesson 1: 1. 3 – 1.8
	Analyze computational artifacts.	JSP Lesson 1: 1.8 - 1.9
Standard 2 - Computing fosters creative expression.	Use computing tools and techniques for creative expression.	JSP Lesson 2: 2.9
Standard 3 - Programming is a creative process.	Use programming as a creative tool.	JSP Lesson 2: 2.9

**Strand 2** – learn to work with multiple levels of abstraction while engaging with computational problems and systems .

Standard	Task	Simply Coding Courses
Standard 1 - A combination of abstractions built upon binary sequences can be used to represent all digital data.	Describe the combination of abstractions used to represent data.	JSP Lesson 1: 1.6 – 1.9
	Explain how binary sequences are used to represent digital data.	ITW: Portfolio Binary
Standard 2 - Multiple levels of abstraction are used in computation.	Develop an abstraction.	JSP Lesson 1: 1.5
	Use multiple levels of abstraction in computation.	JSP Lesson 7: 7.3 – 7.6
Standard 3 - Models and simulations use abstraction to raise and answer questions.	Use models and simulations to raise and answer questions	JSP Lesson 4: 4.1 – 4.2

**Strand 3** – work with data using a variety of tools and techniques to better understand the many ways in

which data is transformed into information and knowledge. .

<b>Standard</b>	<b>Task</b>	<b>Simply Coding Courses</b>
Standard 1 - People use computer programs to process information to gain insight and knowledge.	Use computers to process information to gain insight and knowledge.	JSP Lesson 1: 1.2
	Collaborate when processing information to gain insight and knowledge.	JSP Pong Game Challenge (after Lesson 2.9)
	Communicate insight and knowledge gained from using computer programs to process information.	JSP Pong Game Challenge (after Lesson 2.9)
Standard 2 - Computing facilitates exploration and the discovery of connections in information.	Use computing to facilitate exploration and the discovery of connections in information.	JSP Lesson 1: 1.5
	Use large data sets to explore and discover information and knowledge.	JSP Lesson 7: 7.6 Lesson 9: 9.3
Standard 3 - Computational manipulation of information requires consideration of representation, storage, security, and transmission.	Analyze the considerations involved in the computational manipulation of information.	JSP Lesson 7: 7.6 JSP Lesson 9: 9.3

**Strand 4** - Implement algorithms in some language, and they will analyze algorithms both analytically and empirically

<b>Standard</b>	<b>Task</b>	<b>Simply Coding Courses</b>
Standard 1 - An algorithm is a precise sequence of instructions for a process that can be executed by a computer.	Develop an algorithm designed to be implemented to run on a computer	ITW Lesson 17 – Lesson 19
Standard 2 - Algorithms are expressed using languages.	Express an algorithm in a language.	ITW Lesson 17: 17.1
Standard 3 - Algorithms can solve many but not all problems.	Appropriately connect problems and potential algorithmic solutions.	ITW Lesson 17: 17.1 – 17.4
Standard 4 - Algorithms are evaluated analytically and empirically.	Evaluate algorithms analytically and empirically.	JSP Lesson 2: 2.2 – 2.3

**Strand 5** - Create programs, translating human intention into computational artifacts.

Standard	Task	Simply Coding Courses
Standard 1 - Programs are written to execute algorithms.	Explain how programs implement algorithms.	JSP Lesson 2: 2.2-2.3
Standard 2 - Programming is facilitated by appropriate abstractions.	Use abstraction to manage complexity in programs.	ITW Lesson 15: 15.2
Standard 3 - Programs are developed and used by people.	Evaluate a program for correctness.	JSP Lesson 1: 1.7
	Develop a correct program.	JSP Lesson 1 & Lesson 2
	Collaborate to solve a problem using programming.	ITW Lesson 8: 8.2
Standard 4 - Programming uses mathematical and logical concepts.	Employ appropriate mathematical and logical concepts in programming.	JSP Lesson 4: 4.1 – 4.4

**Strand 6** - Gain insight into how the Internet operates, study characteristics of the Internet and systems built upon it, and analyze important concerns such as cybersecurity.

Standard	Task	Simply Coding Courses
Standard 1 - The Internet is a network of autonomous systems	Explain the abstractions in the Internet and how the Internet functions	ITW Portfolio: Video 1 - Internet
Standard 2 - Characteristics of the Internet and the systems built on it influence their use.	Explain characteristics of the Internet and the systems built on it.	ITW Portfolio: Video 1 - Internet
	Analyze how characteristics of the Internet and the systems built on it influence their use.	ITW Portfolio: Video 1 - Internet
Standard 3 - Cybersecurity is an important concern for the Internet and the systems built on it.	Connect the concern of cybersecurity with the Internet and the systems built on it.	ITW Portfolio: Video 2 – Degrees of Information

**Strand 7** - Computing enables innovation to analyze the potential benefits and harmful effects of computing in a number of contexts.

Standard	Task	Simply Coding Courses
Standard 1 - Computing affects communication, interaction, and cognition.	Analyze how computing affects communication, interaction, and cognition.	ITW - Video 3: The Impact of Personal Computers (Physical Effects)

	Collaborate as part of a process that scales.	JSP Lesson 7: 7.6
Standard 2 - Computing enables innovation in nearly every field.	Connect computing with innovations in other fields.	ITW: Lesson 1: 1.1 Introduction
Standard 3 - Computing has both beneficial and harmful effects.	Analyze the beneficial and harmful effects of computing.	ITW - Video 3: The Impact of Personal Computers (Physical Effects)
Standard 4 - Computing is situated within economic, social, and cultural contexts.	Connect computing within economic, social, and cultural contexts.	ITW - Video 3: The Impact of Personal Computers (Physical Effects)

## COMPUTATIONAL THINKING PRACTICES

Standard 1 - Learn to draw connections between different computing concepts

<b>Task</b>	<b>Simply Coding Courses</b>
Identify impacts of computing	ITW Lesson 1: Overview
Describe connections between people and computing;	ITW Lesson 1: Overview
Explain connections between computing concepts.	JSP Portfolio: Portfolio 1 ITW Portfolio: Portfolio 1

Standard 2 - Learn to draw connections between different computing concepts

<b>Task</b>	<b>Simply Coding Courses</b>
Identify impacts of computing Create an artifact with a practical, personal, or societal intent;	ITW Lesson 8 & Lesson 9 – 19; JPS Portfolio: Portfolio 1
Select appropriate techniques to develop a computational artifact;	JSP Final Project
Use appropriate algorithmic and information-management principles.	JSP Final Project

Standard 3 - Use abstraction to develop models and simulations of natural and artificial phenomena, to make predictions about the world, and analyze their efficacy and validity.

<b>Task</b>	<b>Simply Coding Courses</b>
Explain how data, information, or knowledge are represented for computational use.	Whole course

Explain how abstractions are used in computation or modeling;	Whole Course
Identify abstractions;	Whole Course
Describe modeling in a computational context.	Whole course

Standard 4 - Design and produce solutions, models, and artifacts. Evaluate and analyze their own computational work as well as the computational work that others have produced.

<b>Task</b>	<b>Simply Coding Courses</b>
Evaluate a proposed solution to a problem;	JSP Final Project
Locate and correct errors;	JSP Lesson 1: 1.6; JSP Challenges after Lessons 2, 4 & 6
Explain how an artifact functions;	Whole course
Justify appropriateness and correctness.	JSP Final Project

Standard 5 - Describe computation and the impact of technology and computation, explain and justify the design and appropriateness of their computational choices

<b>Task</b>	<b>Simply Coding Courses</b>
Explain the meaning of a result in context;	JSP Lesson 9: 9.4
Describe computation with accurate and precise language, notation, or visualizations.	JSP Lesson 9: 9.4
Summarize the purpose of a computational artifact.	JSP Final Project

Standard 6 - Collaborate in a number of activities, including investigation of questions using data sets and in the production of computational artifacts

<b>Task</b>	<b>Simply Coding Courses</b>
Collaborate with another student in solving a computational problem;	JSP Final Project
Collaborate with another student in producing an artifact;	JSP Final Project
Collaborate at a large scale.	JSP Final Project