Washington Office of Superintendent of
PUBLIC INSTRUCTION

Career & Technical Education
Curriculum Framework

Required Form

Course Information		
Course: AP Computer Science Principles		**Total Framework Actual Hours:** 180
CIP Code: 110201	☒ **Exploratory** ☐ **Preparatory** *Preparatory courses are best built with a min. of 140 hours.*	**Date Last Modified:** 08.2022
Career Cluster: Information Technology		**Cluster Pathway:** Programming and Software Development
Course Summary:		

Industry-Recognized Credentials:
You Science Precision Exams - 21st Century Success Skills
You Science Precision Exams - Computer Programming II (Java)
You Science Precision Exams - Computer Programming II (Python)
You Science Precision Exams - Computer Programming, Advanced
You Science Precision Exams - Computer Science Principles

Work-Based Learning:
Career Research and Job Interview/Job Shadow in Course-Related Area
Guest Speaker (In-person and/or remote)
Industry Related Field Trips

CTSO:
TSA

Suggested Course Language:
Phyton

Course Software:
Currently not available

Course Equipment:
Currently not available

Unit Information	
Unit: Creative Computing for All	**Total Learning Hours for Unit:** 50
Unit Summary:	
Components and Assessments	
Performance Assessments: Students will apply the coding fundamentals and creativity skills they learned to use Turtle module in Python to create art (images, animations).	
Leadership Alignment: 1.A.2 Create new and worthwhile ideas (both incremental and radical concepts) 2.C.4 Interpret information and draw conclusions based on the best analysis 4.B.2 Manage the flow of information from a wide variety of sources 6.A.1 Use technology as a tool to research, organize, evaluate and communicate information	
Industry Standards and/or Competencies	
Name of standards:	**Website:**
• 3A-CS-01 Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects. (P. 4.1) • 3A-CS-02 Compare levels of abstraction and interactions between application software, system software, and hardware layers. (P. 4.1) • 3A-IC-24 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices. (P. 1.2) • 3A-AP-13 Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests. (P. 5.2) • 3A-AP-14 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs • 3S-AP-23 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs	
Aligned Washington State Learning Standards	
Educational Technology	1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes 4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. 4.c. Develop, test and refine prototypes as part of a cyclical design process 6.a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication. 6.d. Publish or present content that customizes the message and medium for their intended audiences.

Unit Information	
Unit: very Bit of the Internet	**Total Learning Hours for Unit:** 45
Unit Summary:	
Components and Assessments	

Performance Assessments: Students will use their knowledge of cybersecurity and internet to create a custom encoder.
Leadership Alignment: 1.A.3 Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts 2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems 4.A.1 Access information efficiently (time) and effectively (sources)

Industry Standards and/or Competencies	
Name of standards:	**Website:**
• 3A-NI-07 Compare various security measures, considering tradeoffs between the usability and security of a computing system. (6.3) • 3B-NI-03 Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology). (P. 7.2) • 3B-NI-04 Compare ways software developers protect devices and information from unauthorized access. (P. 7.2) • 3B-AP-18 Explain security issues that might lead to compromised computer programs. (P. 7.2)	

Aligned Washington State Learning Standards	
Educational Technology	3.c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions. 4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. 5.c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Unit Information	
Unit: Little Data to Big Data	**Total Learning Hours for Unit:** 57
Unit Summary:	

Components and Assessments
Performance Assessments: Students will visualize and analyze data and make predictions from data.
Leadership Alignment: 2.D.1 Solve different kinds of non-familiar problems in both conventional and innovative ways 4.A.1 Access information efficiently (time) and effectively (sources) 4.B.2 Manage the flow of information from a wide variety of sources 4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information 9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgrounds

Industry Standards and/or Competencies	
Name of standards:	**Website:**
• 3A-DA-10 Evaluate the tradeoffs in how data elements are organized and where data is stored. (P. 3.3)	

- 3A-DA-11 Create interactive data visualizations using software tools to help others better understand real-world phenomena. (P. 4.4)
- 3A-DA-12 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process. (P. 4.4)
- 3A-AP-17 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. (P. 3.2)
- 3B-DA-06 Select data collection tools and techniques to generate data sets that support a claim or communicate information. (P. 7.2)
- 3B-IC-26 Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society. (P. 1.2)

Aligned Washington State Learning Standards	
Educational Technology	3.d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions. 5.b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making. 6.b. Students create original works or responsibly repurpose or remix digital resources into new creations.
Mathematics	CCSS.MATH.CONTENT.HSS.ID.B.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. CCSS.MATH.CONTENT.HSS.ID.B.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. CCSS.MATH.CONTENT.HSS.IC.B.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. CCSS.MATH.CONTENT.HSS.IC.B.4 Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

Unit Information	
Unit: Solving Complex Problems	**Total Learning Hours for Unit:** 28
Unit Summary:	

Components and Assessments

Performance Assessments:
Students will elect a computing innovation and create a digital artifact that describes the computing innovation's impact. They explore the legal, ethical, and unintended consequences of its use.

Leadership Alignment:
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems
2.C.3 Synthesize and make connections between information and arguments
s4.A.2 Evaluate information critically and competently
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
7.A.1 Adapt to varied roles, jobs responsibilities, schedules and contexts

8.C.1 Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise	
Industry Standards and/or Competencies	
Name of standards:	**Website:**
• 3A-AP-16 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. (P. 5.2) • 3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. (P. 5.2) • 3A-AP-20 Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries. (P. 7.3) • 3A-AP-21 Evaluate and refine computational artifacts to make them more usable and accessible. (P. 6.3)	
Aligned Washington State Learning Standards	
Educational Technology	3.a. Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits. 4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. 6.b. Students create original works or responsibly repurpose or remix digital resources into new creations. 7.b. Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.