Washington Computer Science

Level 3A: 9-10

Computing Systems	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-CS-03	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors. P.6.2
Networks and the Internet	3A-NI-04	Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing. P.4.1
	3A-NI-05	Give examples to illustrate how sensitive data can be affected by malware and other attacks. P.7.2
	3A-NI-06	Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts P.3.3
	3A-NI-07	Compare various security measures, considering tradeoffs between the usability and security of a computing system. 6.3
	3A-NI-08	Explain tradeoffs when selecting and implementing cybersecurity recommendations. P.7.2
Data and Analysis	3A-DA-09	Translate between different bit representations of real-world phenomena, such as characters, numbers, and images. P.4.1
	3A-DA-10	Evaluate the tradeoffs in how data elements are organized and where data is stored. P3.3
	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
Algorithms and Programming	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	**Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.** P.4.1
	3A-AP-15	**Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.** P.5.2
	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-17	**Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.** P.3.2
	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-19	**Systematically design and develop programs for broad audiences by incorporating feedback from users** P.5.1
	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
	3A-AP-22	**Design and develop computational artifacts working in team roles using collaborative tools.** P.2.4
	3A-AP-23	**Document – esign decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.** P.7.2
Impacts of Computing	**3A-IC-24**	**Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** P.1.2
	3A-IC-25	**Test and refine computational artifacts to reduce bias and equity deficits.** P.1.2
	3A-IC-26	**Demonstrate ways a given algorithm applies to problems across disciplines.** P.3.1
	3A-IC-27	**Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.** P.2.4
	3A-IC-28	**Explain the beneficial and harmful effects that intellectual property laws can have on innovation.** P.7.3

3A-IC-29 **Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.** P.7.2

3A-IC-30 **Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.** P.7.3