Non-AP Explore: Impact of Computing Innovations

Computing innovations impact our lives in many ways that require considerable study and reflection for us to fully understand them. In this performance task, you will explore a citizen science computing innovation in preparation for exploring an innovation of your choosing. A computing innovation is an innovation that includes a computer or program code as an integral part of its functionality. Your close examination of this computing innovation will deepen your understanding of computer science principles.

Performance Task: Impacts of Computing Innovations

Select and research a computing innovation of your own choosing. (Students should not use the citizen science app that they investigated earlier.) Computing innovations are innovations that include a computer or program code as an integral part of their functionality. For example, self-driving cars are an example of an innovation that uses both hardware (the car, sensors, computer, etc.) as well as software (program code) to drive a car without a person steering the wheel or taking control of the car. However, near field communication (NFC), is not a computing innovation; rather, it is a standard that allows computing innovations to transfer data between them when they are close together.

To find a computing innovation, you could look at current news articles for inspiration. Mobile CSP maintains a list at diigo.com/user/mobilecsp, tagged by topics in the CSP course. You should find at least 5 credible sources on your innovation. (Examples of credible sources and fact-checking tips and tools.) A reference list should be included with the project (e.g. at the end of a video, presentation, paper, part of a poster) and should follow standard formats such as MLA or APA as specified by the instructor. Include citations in your artifact for the information you gathered.

Write a paper or create a presentation, poster, or other artifact that answers the following questions about the computing innovation.
1. What is the *purpose* of your chosen computing innovation? Make sure you explain how it is a computing innovation as well.
2. What *data* does the innovation use and how does the innovation use the data collected?
3. What are the intended *positive impacts* of your computing innovation? What might be some unintended *negative impacts*? You might consider impacts on society, the economy, culture, etc. These should be plausible impacts, which most people would consider reasonable or probable.

Artifact Formats:

Note: your teacher may specify one of the following artifact formats or may allow you to choose among the different options.

- Paper (~3 pages, double-spaced, Times New Roman, Font Size 12)
- Presentation (in-class or video recording, ~5 minutes)
- Poster or infographic
- A different artifact with instructor permission (audio recording, skit, brochure, etc.)

Grading Rubric

Criteria (Weight)	Beginning	Developing	Mastering	Exemplary
Purpose (25%)	Identifies an innovation that is related to computers. Provides a simple explanation of its purpose.	Identifies a computing innovation. Provides a simple explanation of its purpose.	Identifies a computing innovation. Provides a general explanation of the innovation's purpose.	Identifies a computing innovation, including how it meets the criteria for being a computing innovation. Provides a clear explanation of the innovation's intended purpose.
Data (25%)	Identifies that data is used by the innovation in general without providing specific information on the type of data or whether it is input or output data. Provides a simple explanation of how the data is used by the innovation.	Identifies a type of data processed by the innovation. Provides a general explanation of how the data is used by the innovation.	Identifies the data processed by the innovation and its data type. Includes input data, data processing, OR output data. Provides a general explanation of how the data is used by the innovation to fulfill its purpose.	Identifies the data processed by the innovation and its data type (e.g. text, number, date, etc.) Include input data, data processing, and output data. Provides a clear explanation of how the data is used by the innovation to fulfill its purpose.
Impacts (25%)	Identifies one or more beneficial or harmful impacts of the innovation.	Identifies at least one beneficial intended impact and one harmful unintended impact of the innovation.	Identifies at least one *plausible* beneficial intended impact and one *plausible* harmful unintended impact of the innovation.	Identifies at least one plausible beneficial intended impact and one plausible harmful unintended impact of the innovation. Explanation includes how the impacts affect society, economy, culture, etc.
Sources (10%) (Reference List and Citations)	0 credible sources Attempts to include and acknowledge sources to support ideas.	1-2 credible sources Attempts to include and acknowledge credible and/or relevant sources to support ideas.	3 credible sources Includes and acknowledges credible, relevant sources to support ideas.	4+ credible sources (peer-reviewed, newspaper, recent, etc.) Includes and acknowledges high quality, credible, relevant sources to

				develop ideas.
Communication (15%)	Main idea in artifact is unclear and insufficiently supported by detail. Artifact has weak attempts to use a consistent system for basic organization.	Main idea in artifact is clear, needs to improve logical order of examples, and/or relevance/quality of evidence. Artifact meets most expectations appropriate to a specific format for basic organization, content, and presentation.	Main idea in artifact is clear. Examples follow logical order. Artifact follows expectations appropriate to a specific format for basic organization, content, and presentation.	Artifact includes a clearly developed main idea with effective introductions and conclusions. Evidence in artifact provides support and is organized logically. Artifact uses relevant, compelling, and concrete examples to illustrate the main idea.

Teacher Lesson Plan

Number of class periods/amount of time:
- Citizen Science Apps: 90 minutes
- Performance Task: 180 - 270 minutes

Collaboration:
Students should select their own computing innovation, but teachers should encourage them to share and gather feedback with each other, including confirming that it is an innovation, sharing their resources, reviewing what they create (stoplight activity), etc.