

# **Unit 6 Lesson 1**

**Explore PT: Review the Task (1 hr)**

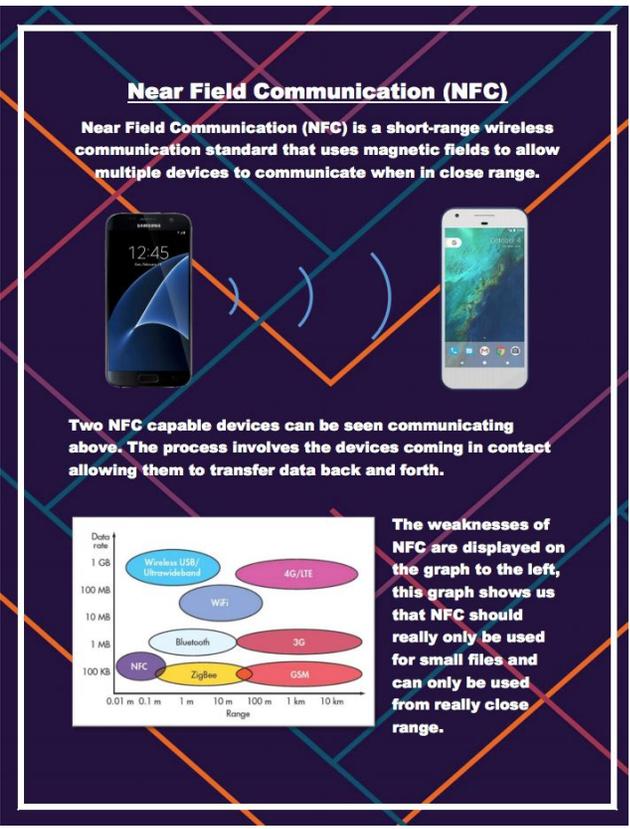
**Resources**

# Explore PT - Sample E - score: 2/8

<b>Total score</b>	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	<i>This document combines student sample, scoring guidelines and scoring commentary from: <a href="#">Explore PT Sample E</a></i>
<b>Sample: E</b>	1	0	1	0	0	0	0	0	

## Computational Artifact

Your computational artifact must provide an illustration, representation, or explanation of the computing innovation’s intended purpose, its function, or its effect. The computational artifact must not simply repeat the information supplied in the written responses and should be primarily non-textual.

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
	<p><b>Row 1</b> <b>Computational Artifact</b></p> <p>The computational artifact:</p> <ul style="list-style-type: none"> <li>Identifies the computing innovation.</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>Provides an illustration, representation, or explanation of the computing innovation’s intended purpose, function, or effect.</li> </ul>	<p>The written response can be used to aid the understanding of how the computational artifact illustrates, represents, or explains the computing innovation’s intended purpose, function, or effect.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>there is no artifact;</li> <li>the artifact is not a computational artifact;</li> <li>the innovation identified in the artifact does not match the innovation described in the written response;</li> <li>the artifact does not identify the innovation clearly;</li> <li>the artifact does not illustrate, represent or explain the innovation’s intended purpose, function, or effect;</li> <li>the artifact illustrates a feature of the innovation instead of the purpose, function, or effect; or</li> <li>the written response describes the innovation’s intended purpose and function without explaining how the computational artifact illustrates, represents, or explains the intended purpose, function, or effect.</li> </ul>
	<p><b>The response earned the point for this row.</b> The artifact identifies the innovation as near field communication (NFC) and illustrates purpose: coming in contact and transferring data back and forth.</p>	

## Computational Artifact

2a. Provide information on your computing innovation and computational artifact.

- Name the computing innovation that is represented by your computational artifact.
- Describe the computing innovation's intended purpose and function.
- Describe how your computational artifact illustrates, represents, or explains the computing innovation's intended purpose, its function, or its effect.

(Must not exceed 100 words)

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
<p>The computing innovation demonstrated by my computational artifact is Near Field Communication (NFC). Near Field Communication is a technology that was created in order to let different devices like smartphones communicate with other NFC enabled devices. With this power to connect two devices that are near each other you have the ability to transfer data across both devices without having to connect both of them through a cable or over a wireless network that will transfer everything slower. A new emerging use for NFC has become the ability to pay with it in stores that have NFC enabled scanners. The idea of not having to carry a real wallet around appeals to many people nowadays. (116)</p>	<p><b>Row 2 - Response 2A</b></p> <p>States a fact about the correctly identified computing innovation's intended purpose OR function.</p>	<p><b>Do NOT award a point if:</b></p> <ul style="list-style-type: none"> <li>• the identified innovation is not a computing innovation; or</li> <li>• the written statement gives an effect (which is required for the scoring criteria in Row 3, not Row 2).</li> </ul>
	<p><b>The response DID NOT earn the point for this row.</b> The innovation, 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.</p>	

2b. Describe your development process, explicitly identifying the computing tools and techniques you used to create your artifact. Your description must be detailed enough so that a person unfamiliar with those tools and techniques will understand your process.

(Must not exceed 100 words)

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
<p>My development process was a lot of a learning process for me. I learned not only about NFC but also about how I could easily relay information I had just obtained to people in a much simpler way. I used Microsoft Word to do my artifact which might sound easy because it is something that we all use but it is actually very complex. I used a lot of the drawing tools to make different shapes like the arrow and I edited the pictures so they would fit in. I also had to use text align to make the text easy to see and pleasing to read. Overall my experience making this artifact was great and I think it is a great way for people to start sharing their knowledge on different subjects. (133)</p>	--	---
	<p><b>Response 2b will NOT be scored in 2018</b></p>	

## Computing Innovation

2c. Explain at least one beneficial effect and at least one harmful effect the computing innovation has had, or has the potential to have, on society, economy, or culture.

(Must not exceed 250 words)

Student Response	Scoring Guidelines	
<p>NFC has many different advantages and disadvantages. One of the advantages that comes along with NFC is the ability to transfer data and pay for things with your mobile device. Transferring data over Wifi can sometimes prove to be slow and ineffective when it comes to nearby transferring. This is where NFC can come along and allow people to transfer all this data at faster rates if both devices are close. The other side of the coin is paying at stores with NFC technology embedded in today's phones. This allows people to have a realistic "mobile wallet" that can work as their card in places that support NFC payments. As good as this all sounds people do see some downsides to it, privacy and security. With NFC there is more data that is given to companies like Google and Apple that can mine your data and do certain things with it. Also with the payments, people are scared of storing their debit and credit cards online. While if a hacker did go to extreme heights to access all the cards, it would be very difficult due to these companies securing your cards through token authentication. (195)</p>	Row and Task	Decision Rules
	<p><b>Row 3 - Response 2C</b></p> <p>Identifies at least ONE effect of the identified or described computing innovation.</p>	<p>The effect does not need to be specifically identified as beneficial or harmful. The effect must be identified, but it doesn't have to be described to earn the point.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>the described innovation is not a computing innovation;</li> <li>the response does not state an effect (The purpose or function of the computing innovation is not the effect of the innovation.); or</li> <li>the identified effect is not a result of the use of the innovation as intended (e.g., a self-driving car is not intended to crash, therefore, its exposure to hacking is not an effect of its intended use).</li> </ul>
	<p><b>The response earned the point for this row.</b></p> <p>The beneficial effect given is the ability to pay for things with your mobile device at faster (transmission) rates. In this response the described computing innovation is the mobile device.</p> <p>[Code.org note: Given the scoring stating this row should not be awarded if the innovation is not a computing innovation, we believe this row should not have been awarded]</p>	
<p><b>Row 4 - Response 2C</b></p> <ul style="list-style-type: none"> <li>Identifies a beneficial effect of the identified or described computing innovation.</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Identifies a harmful effect of the identified or described computing innovation.</li> </ul>	<p>Responses that earn this point will also earn the point for Row 3. Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>the described innovation is not a computing innovation;</li> <li>the response is missing the adjectives harmful or beneficial (or synonyms thereof);</li> <li>the response is missing a plausible beneficial effect;</li> <li>the response is missing a plausible harmful effect; or</li> <li>the identified effect is not a result of the use of the innovation as intended (e.g., a self-driving car is not intended to crash, therefore, its exposure to hacking is not an effect of its intended use).</li> </ul>	

	<p><b>The response DID NOT earn the point for this row.</b>          The beneficial effect given is the ability to pay for things with your mobile device at faster (transmission) rates. No clear harmful effect is identified.</p>	
	<p><b>Row 5 - Response 2C</b></p> <p>Explains how ONE of the identified effects relates to society, economy, or culture.</p>	<p>Responses that earn the point for this row must have earned the point for Row 3. Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>● the described innovation is not a computing innovation; or</li> <li>● the explanation does not connect one of the effects to society, economy, or culture</li> </ul>
	<p><b>The response DID NOT earn the point for this row.</b>          The response does not identify an impact to society, economy, or culture</p>	

2d. Using specific details, describe:

- the data your innovation uses;
- how the innovation consumes (as input), produces (as output), and/or transforms data; and
- at least one data storage concern, data privacy concern, or data security concern directly related to the computing innovation.

(Must not exceed 250 words)

Student Response	Scoring Guidelines	
<p>The data used in NFC is the consumer's data. NFC takes data on your device or someone's else's device and transfers it between both devices. NFC also stores your credit card and debit card data encrypted by software so no one is able to access it. Tokens are used in place of credit card numbers creating fake numbers that lead to nothing. NFC can be consumed by users by using it to transfer data and pay for things online. The only data concern along with this is the process is the concern of data being intercepted. (96)</p>	Row and Task	Decision Rules
	<p><b>Row 6 Response 2D</b></p> <ul style="list-style-type: none"> <li>• Identifies the data that the identified or described computing innovation uses AND</li> <li>• Explains how that data is consumed, produced, OR transformed.</li> </ul>	<p>Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the described innovation is not a computing innovation;</li> <li>• the response does not state the specific name of the data or simply says "data";</li> <li>• the response confuses or conflates the innovation with the data: response fails to explain what happens to the data; or</li> <li>• the response confuses the source of the data with the data.</li> </ul>
	<p><b>The response DID NOT earn the point for this row.</b> The data described is "consumer's data," which is not sufficient for identifying what data is being used by the described computing innovation, which in this case is the handheld device.</p>	
	<p><b>Row 7 Response 2D</b></p> <ul style="list-style-type: none"> <li>• Identify one data storage, data privacy, OR</li> <li>• data security concern related to the identified or described computing innovation.</li> </ul>	<p>Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer. Responses can earn this point even if they refer to the data in a general without specifically identifying the data being used.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the described innovation is not a computing innovation; or</li> <li>• the response identifies or describes a concern that is not related to data</li> </ul>
<p><b>The response DID NOT earn the point for this row.</b> The response does not identify the data concern as a security, privacy or storage data concern.</p>		

## References

2e. Provide a list of at least three online or print sources used to create your computational artifact and/or support your responses through in-text citation to the prompts provided in this performance task.

- At least two of the sources must have been created after the end of the previous academic year.
- For each online source, include the complete and permanent URL. Identify the author, title, source, the date you retrieved the source, and, if possible, the date the reference was written or posted.
- For each print source, include the author, title of excerpt/article and magazine or book, page number(s), publisher, and date of publication.
- If you include an interview source, include the name of the person you interviewed, the date on which the interview occurred, and the person's position in the field.
- Include in-text citations for the sources you used.
- Each source must be relevant, credible, and easily accessed.

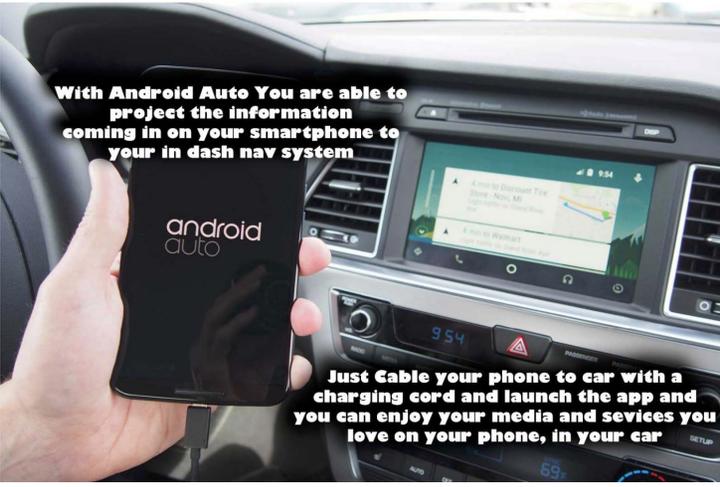
Student Response	Scoring Guidelines	
<a href="https://developer.android.com/guide/topics/connectivity/nfc/index.html">https://developer.android.com/guide/topics/connectivity/nfc/index.html</a> <a href="http://nearfieldcommunication.org/">http://nearfieldcommunication.org/</a> <a href="https://nfc-forum.org/what-is-nfc/">https://nfc-forum.org/what-is-nfc/</a>	Row and Task	Decision Rules
	<p><b>Row 8</b>  <b>Response 2E &amp; Artifact</b></p> <p>References, through in-text citation, at least 3 different sources.</p>	<p>The in-text citations can be in either the artifact or the written response. The in-text citations may be oral in the computational artifact.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the response contains a list of sources only, no in-text citations;</li> <li>• the response contains less than three in-text citations; or</li> <li>• there are fewer than three sources cited, even if there are three or more in-text citations.</li> </ul>
	<p><b>The response DID NOT earn the point for this row.</b>            There are no in-text citations to reference the bibliography</p>	

# Explore PT - Sample D - Score 5/8

<b>Total score</b>	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	<i>This document combines student sample, scoring guidelines and scoring commentary from: <a href="#">Explore PT Sample D</a></i>
<b>Sample: D</b>	1	1	1	0	0	0	1	1	

## Computational Artifact

Your computational artifact must provide an illustration, representation, or explanation of the computing innovation’s intended purpose, its function, or its effect. The computational artifact must not simply repeat the information supplied in the written responses and should be primarily non-textual.

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
 <p><b>With Android Auto You are able to project the information coming in on your smartphone to your in dash nav system</b></p> <p><b>Just Cable your phone to car with a charging cord and launch the app and you can enjoy your media and sevicees you love on your phone, in your car</b></p>	<p><b>Row 1 Computational Artifact</b></p> <p>The computational artifact:</p> <ul style="list-style-type: none"> <li>Identifies the computing innovation.</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>Provides an illustration, representation, or explanation of the computing innovation’s intended purpose, function, or effect.</li> </ul>	<p>The written response can be used to aid the understanding of how the computational artifact illustrates, represents, or explains the computing innovation’s intended purpose, function, or effect.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>there is no artifact;</li> <li>the artifact is not a computational artifact;</li> <li>the innovation identified in the artifact does not match the innovation described in the written response;</li> <li>the artifact does not identify the innovation clearly;</li> <li>the artifact does not illustrate, represent or explain the innovation’s intended purpose, function, or effect;</li> <li>the artifact illustrates a feature of the innovation instead of the purpose, function, or effect; or</li> <li>the written response describes the innovation’s intended purpose and function without explaining how the computational artifact illustrates, represents, or explains the intended purpose, function, or effect.</li> </ul>
<p><b>The response earned the point for this row.</b> The computational artifact identified the computing innovation as Android Auto and illustrates the purpose by explaining the purpose in text over the illustration of the phone interfacing with the car.</p>		

## Computational Artifact

2a. Provide information on your computing innovation and computational artifact.

- Name the computing innovation that is represented by your computational artifact.
- Describe the computing innovation's intended purpose and function.
- Describe how your computational artifact illustrates, represents, or explains the computing innovation's intended purpose, its function, or its effect.

(Must not exceed 100 words)

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
<p>The technological innovation that I chose was Android Auto. Android Auto is a new program designed by google for cars and now native to android phones [1] to be able to translate the features used on someones android phone to the car's in dash head unit. Now the information is not just mirrored to the car, the program takes the 3 big things that most people want to use their phones for in the car, Phone calls, navigation from google maps, and streaming music from music services like pandora and google play music and translates them in a way that it can work with minimal distraction on a car's display. The artifact illustrates it purpose by showcasing that all you have to do with android auto is cable your phone to the car and the program will allow you to put your phone's maps, music, and phone capabilities in the in dash screen. (153)</p>	<p><b>Row 2 - Response 2A</b></p> <p>States a fact about the correctly identified computing innovation's intended purpose OR function.</p>	<p><b>Do NOT award a point if:</b></p> <ul style="list-style-type: none"> <li>• the identified innovation is not a computing innovation; or</li> <li>• the written statement gives an effect (which is required for the scoring criteria in Row 3, not Row 2).</li> </ul>
	<p><b>The response earned the point for this row.</b> The response indicates that the function of Android Auto is to "be able to translate the features used on someone's android phone to the car's in dash head unit".</p>	

2b. Describe your development process, explicitly identifying the computing tools and techniques you used to create your artifact. Your description must be detailed enough so that a person unfamiliar with those tools and techniques will understand your process.

(Must not exceed 100 words)

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
<p>The development process was a rather straight forward process. I started off with an image found online showcasing the technology in a 2015 Hyundai Sonata. I then took the image and put it into adobe photoshop where I put in a brief explanation of the innovation into the photo. Then I used photoshop's tool to add a backshadow on the text to give a more prominent look so it's easier on the reader to see. I then exported the photo as a png. (83)</p>	--	---
	<p><b>Response 2b will NOT be scored in 2018</b></p>	

## Computing Innovation

2c. Explain at least one beneficial effect and at least one harmful effect the computing innovation has had, or has the potential to have, on society, economy, or culture.

(Must not exceed 250 words)

Student Response	Scoring Guidelines	
<p>With any technology, there are some positives and negatives to it. Android auto is no exception. With the positives, Android auto has the ability to cut down on driver distraction due to the fact that the device that people are notorious for using while driving, is no longer being juggled in someone's hand and is now on a car screen with voice controls used from the voice button on the steering wheel[4], that can help reduce distraction in the car and prevent distracted driving accidents. Also, the innovation has the ability to put an end to the issue with cars infotainment screens of today which are updates. By utilizing the cloud being able to have a constantly updated navigation system and app connected system without the need of having to go to the dealer and be charged for the service of updating a car which can be 100's of dollars to do[3]. But while there are many positives to something, there are some negatives that lurk within. One is that the program depending on the vehicle you have can be cumbersome to those not familiar with there car system. In the case of many german cars such as mercedes benz and audi, Those vehicles don't have touch screen, which Android auto is optimized for and will need to be controlled through the turn, click, and kick controllers of the Mercedes COMAND system and Audi MMI system.[2]. (239)</p>	Row and Task	Decision Rules
	<p><b>Row 3 - Response 2C</b></p> <p>Identifies at least ONE effect of the identified or described computing innovation.</p>	<p>The effect does not need to be specifically identified as beneficial or harmful. The effect must be identified, but it doesn't have to be described to earn the point.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>the described innovation is not a computing innovation;</li> <li>the response does not state an effect (The purpose or function of the computing innovation is not the effect of the innovation.); or</li> <li>the identified effect is not a result of the use of the innovation as intended (e.g., a self-driving car is not intended to crash, therefore, its exposure to hacking is not an effect of its intended use).</li> </ul>
	<p><b>The response earned the point for this row.</b> The response states an effect: "Android auto has the ability to cut down on driver distraction"</p>	
	<p><b>Row 4 - Response 2C</b></p> <ul style="list-style-type: none"> <li>Identifies a beneficial effect of the identified or described computing innovation.</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Identifies a harmful effect of the identified or described computing innovation.</li> </ul>	<p>Responses that earn this point will also earn the point for Row 3. Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>the described innovation is not a computing innovation;</li> <li>the response is missing the adjectives harmful or beneficial (or synonyms thereof);</li> <li>the response is missing a plausible beneficial effect;</li> <li>the response is missing a plausible harmful effect; or</li> <li>the identified effect is not a result of the use of the innovation as intended (e.g., a self-driving car is not intended to crash, therefore, its exposure to hacking is not an effect of its intended use).</li> </ul>
<p><b>The response DID NOT earn the point for this row.</b> The response states a beneficial effect: "Android auto has the ability to cut down on driver distraction." The response does not indicate a harmful effect directly caused by the innovation. The difficulty of using the innovation in some cars is not due to the innovation itself, but instead is due to the car's interface or features.</p>		

	<p><b>Row 5 - Response 2C</b></p> <p>Explains how ONE of the identified effects relates to society, economy, or culture.</p>	<p>Responses that earn the point for this row must have earned the point for Row 3. Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>● the described innovation is not a computing innovation; or</li> <li>● the explanation does not connect one of the effects to society, economy, or culture</li> </ul>
	<p><b>The response DID NOT earn the point for this row.</b> The written response does not connect one of the effects to society, economy, or culture.</p>	

2d. Using specific details, describe:

- the data your innovation uses;
- how the innovation consumes (as input), produces (as output), and/or transforms data; and
- at least one data storage concern, data privacy concern, or data security concern directly related to the computing innovation.

(Must not exceed 250 words)

Student Response	Scoring Guidelines	
<p>The data that Android auto is using, is the data from your smartphone. The program is able to connect with your phone and import the data from sources like google maps, your phone book, streaming apps, and notifications that show up on the phone and output to the screen in the car. There have been security concerns not from the program itself, but the potential for hackers to get control of the program and possibly get control of the car like what happened with a chrysler vehicle and two hackers were able to fully control the car from miles away.<sup>[5]</sup> There have also been some privacy concerns about the use of the program having access to location tracking which can broadcast where you are at any given time from having your phone in the car. (136)</p>	Row and Task	Decision Rules
	<p><b>Row 6 Response 2D</b></p> <ul style="list-style-type: none"> <li>• Identifies the data that the identified or described computing innovation uses AND</li> <li>• Explains how that data is consumed, produced, OR transformed.</li> </ul>	<p>Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the described innovation is not a computing innovation;</li> <li>• the response does not state the specific name of the data or simply says “data”;</li> <li>• the response confuses or conflates the innovation with the data: response fails to explain what happens to the data; or</li> <li>• the response confuses the source of the data with the data.</li> </ul>
	<p><b>The response DID NOT not earn the point for this row.</b> Data is identified as google maps, your phonebook, and streaming apps, however it does not identify the specific data these apps are using.</p>	
	<p><b>Row 7 Response 2D</b></p> <ul style="list-style-type: none"> <li>• Identify one data storage, data privacy, OR</li> <li>• data security concern related to the identified or described computing innovation.</li> </ul>	<p>Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer. Responses can earn this point even if they refer to the data in a general without specifically identifying the data being used.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the described innovation is not a computing innovation; or</li> <li>• the response identifies or describes a concern that is not related to data</li> </ul>
<p><b>The response earned the point for this row.</b> The response states a privacy concern that location tracking can “broadcast where you are at any given time from having your phone in the car.”</p>		

## References

**2e.** Provide a list of at least three online or print sources used to create your computational artifact and/or support your responses through in-text citation to the prompts provided in this performance task.

- At least two of the sources must have been created after the end of the previous academic year.
- For each online source, include the complete and permanent URL. Identify the author, title, source, the date you retrieved the source, and, if possible, the date the reference was written or posted.
- For each print source, include the author, title of excerpt/article and magazine or book, page number(s), publisher, and date of publication.
- If you include an interview source, include the name of the person you interviewed, the date on which the interview occurred, and the person's position in the field.
- Include in-text citations for the sources you used.
- Each source must be relevant, credible, and easily accessed.

Student Response	Scoring Guidelines	
<p>[1] Ziegler, Chris. "You Don't Need an Android Auto-compatible Car to Use Android Auto Anymore." The Verge. The Verge, 18 May 2016. Web. 10 Jan. 2017.  <a href="http://www.theverge.com/2016/5/18/11698274/android-auto-app-update-phone-dash-google-io-2016">http://www.theverge.com/2016/5/18/11698274/android-auto-app-update-phone-dash-google-io-2016</a></p> <p>[2] Reports, Consumer. "Apple CarPlay and Android Auto: Pros and Cons." Consumer Reports. N.p., n.d. Web. 12 Jan. 2017.  <a href="http://www.consumerreports.org/cars-apple-carplay-android-auto-car-infotainment-apps/">http://www.consumerreports.org/cars-apple-carplay-android-auto-car-infotainment-apps/</a></p> <p>[3] "Should You Update Your In-Car Nav System for the Holidays?" Consumer Reports. N.p., 4 Dec. 2015. Web. 12 Jan. 2017.  <a href="http://www.consumerreports.org/cro/news/2015/12/should-you-update-your-in-car-nav-system-for-the-holidays/index.htm">http://www.consumerreports.org/cro/news/2015/12/should-you-update-your-in-car-nav-system-for-the-holidays/index.htm</a></p> <p>[4] CNETTV. "CNET On Cars - Road to the Future: Android Auto Launches." YouTube. YouTube, 16 June 2015. Web. 19 Jan. 2017.  <a href="https://www.youtube.com/watch?v=C9J-0AXhquo&amp;t=170s">https://www.youtube.com/watch?v=C9J-0AXhquo&amp;t=170s</a></p> <p>[5] "Hackers Remotely Kill a Jeep on the Highway-With Me in It." Wired. Conde Nast, n.d. Web. 19 Jan. 2017.  <a href="https://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway/">https://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway/</a></p>	Row and Task	Decision Rules
	<p><b>Row 8 Response 2E &amp; Artifact</b></p> <p>References, through in-text citation, at least 3 different sources.</p>	<p>The in-text citations can be in either the artifact or the written response. The in-text citations may be oral in the computational artifact.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the response contains a list of sources only, no in-text citations;</li> <li>• the response contains less than three in-text citations; or</li> <li>• there are fewer than three sources cited, even if there are three or more in-text citations.</li> </ul>
	<p><b>The response earned the point for this row.</b> At least three in-text attributed citations (see responses 2a-d) are provided using parenthetical numbers corresponding to references.</p>	

# Explore PT - Sample C - score: 8/8

<b>Total score</b>	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	<i>This document combines student sample, scoring guidelines and scoring commentary from: <a href="#">Explore PT Sample C</a></i>
<b>Sample: C</b>	1	1	1	1	1	1	1	1	

## Computational Artifact

Your computational artifact must provide an illustration, representation, or explanation of the computing innovation’s intended purpose, its function, or its effect. The computational artifact must not simply repeat the information supplied in the written responses and should be primarily non-textual.

Student Response	Scoring Guidelines	
 <p style="text-align: center;"><b>Global Positioning System</b></p>	Row and Task	Decision Rules
	<p><b>Row 1</b> <b>Computational Artifact</b></p> <p>The computational artifact:</p> <ul style="list-style-type: none"> <li>Identifies the computing innovation.</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>Provides an illustration, representation, or explanation of the computing innovation’s intended purpose, function, or effect.</li> </ul>	<p>The written response can be used to aid the understanding of how the computational artifact illustrates, represents, or explains the computing innovation’s intended purpose, function, or effect.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>there is no artifact;</li> <li>the artifact is not a computational artifact;</li> <li>the innovation identified in the artifact does not match the innovation described in the written response;</li> <li>the artifact does not identify the innovation clearly;</li> <li>the artifact does not illustrate, represent or explain the innovation’s intended purpose, function, or effect;</li> <li>the artifact illustrates a feature of the innovation instead of the purpose, function, or effect; or</li> <li>the written response describes the innovation’s intended purpose and function without explaining how the computational artifact illustrates, represents, or explains the intended purpose, function, or effect.</li> </ul>
<p><b>The response earned the point for this row.</b> The computing innovation is the Global Positioning System (GPS). The artifact illustrates the intended purpose of the GPS by including many different examples of its use, such as directions on a map, use by military personnel, and to find things like keys, pets, and kids.</p>		

## Computational Artifact

2a. Provide information on your computing innovation and computational artifact.

- Name the computing innovation that is represented by your computational artifact.
- Describe the computing innovation's intended purpose and function.
- Describe how your computational artifact illustrates, represents, or explains the computing innovation's intended purpose, its function, or its effect.

(Must not exceed 100 words)

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
<p>The Global Positional System, otherwise known as the GPS, has had a huge impact on society since it has been created. Shown in the computational artifact, GPS has a variety of different uses. Originally, it was created for military purposes, but it was soon realized that civilians could utilize this device according to the "General Information On GPS." Nowadays, it is used for driving directions, tracking lost items, monitoring the locations of children, and much more (Bajaj). The artifact demonstrates the several functions of the GPS within the various pictures and some of the components involved with the functionality of the device. (102)</p>	<p><b>Row 2 - Response 2A</b></p> <p>States a fact about the correctly identified computing innovation's intended purpose OR function.</p>	<p><b>Do NOT award a point if:</b></p> <ul style="list-style-type: none"> <li>• the identified innovation is not a computing innovation; or</li> <li>• the written statement gives an effect (which is required for the scoring criteria in Row 3, not Row 2).</li> </ul>
	<p><b>The response earned the point for this row.</b> The response states the fact of the computing innovation "Originally, it was created for military purposes, but it was soon realized that civilians could utilize this device according to the 'General Information on GPS'."</p>	

2b. Describe your development process, explicitly identifying the computing tools and techniques you used to create your artifact. Your description must be detailed enough so that a person unfamiliar with those tools and techniques will understand your process.

(Must not exceed 100 words)

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
<p>I created my artifact on microsoft word to make it simple yet effective. I first found several images that represented the numerous functions of the GPS and I inserted them into the word document. Then, I strategically placed them around the page in a collage-like form and cropped many of them to make them fit accordingly. Additionally, I inserted my rectangle into the document, formatting it in an aesthetically pleasing way, and put my title in a text box on top of that. With some final little touch-ups and adjustments, I finished my artifact. However, it was in a word document, so I saved it as a PDF to make it officially finished. (113)</p>	--	---
	<p><b>Response 2b will NOT be scored in 2018</b></p>	

## Computing Innovation

2c. Explain at least one beneficial effect and at least one harmful effect the computing innovation has had, or has the potential to have, on society, economy, or culture.

(Must not exceed 250 words)

Student Response	Scoring Guidelines	
<p>Since the GPS innovation has so many potential uses, there are numerous different harmful and beneficial effects, all described in Karen Bajaj's article. When looking at the GPS's ability to track children, this becomes a huge benefit to society. It betters the safety for children nowadays. If they get lost, a parent can easily use their iPhone to track their location. Also, if parents sees that their child is heading towards somewhere that is potentially dangerous, they can prevent the child from getting in trouble. Though it could be seen as an invasion of privacy, it can very easily increase the safety of children or even teenagers. Another GPS function that is very popular is the use of driving directions. While this is very convenient at times, people in society have become very reliant on this luxury. It causes many people to only trust the words of the GPS and to not actually become familiar with the places they are going. If something were to happen while someone was driving and they had to know where they were, many people would have no idea where they were. While many people would be able to use their phone to find out where they are, if for some reason they could not do this, they would be in trouble. While GPS probably has more benefits than detriments, there are definitely some major harmful effects from people's overuse of the GPS. (238)</p>	Row and Task	Decision Rules
	<p><b>Row 3 - Response 2C</b></p> <p>Identifies at least ONE effect of the identified or described computing innovation.</p>	<p>The effect does not need to be specifically identified as beneficial or harmful. The effect must be identified, but it doesn't have to be described to earn the point.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>the described innovation is not a computing innovation;</li> <li>the response does not state an effect (The purpose or function of the computing innovation is not the effect of the innovation.); or</li> <li>the identified effect is not a result of the use of the innovation as intended (e.g., a self-driving car is not intended to crash, therefore, its exposure to hacking is not an effect of its intended use).</li> </ul>
	<p><b>The response earned the point for this row.</b> The response identifies an effect as "it can very easily increase the safety of children or even teenagers."</p>	
	<p><b>Row 4 - Response 2C</b></p> <ul style="list-style-type: none"> <li>Identifies a beneficial effect of the identified or described computing innovation.</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Identifies a harmful effect of the identified or described computing innovation.</li> </ul>	<p>Responses that earn this point will also earn the point for Row 3. Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>the described innovation is not a computing innovation;</li> <li>the response is missing the adjectives harmful or beneficial (or synonyms thereof);</li> <li>the response is missing a plausible beneficial effect;</li> <li>the response is missing a plausible harmful effect; or</li> <li>the identified effect is not a result of the use of the innovation as intended (e.g., a self-driving car is not intended to crash, therefore, its exposure to hacking is not an effect of its intended use).</li> </ul>
<p><b>The response earned the point for this row.</b> The beneficial effect stated is that it would increase the safety of children. The harmful effect stated</p>		

	<p>is the overuse of the GPS. This is more fully explained earlier in the response. The response states, "It causes many people to only trust the words of the GPS and to not actually become familiar with the places they are going. If something were to happen while someone was driving and they had to know where they were, many people would have no idea where they were. While many people would be able to use their phone to find out where they are, if for some reason they could not do this, they would be in trouble."</p>	
	<p><b>Row 5 - Response 2C</b></p> <p>Explains how ONE of the identified effects relates to society, economy, or culture.</p>	<p>Responses that earn the point for this row must have earned the point for Row 3. Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>● the described innovation is not a computing innovation; or</li> <li>● the explanation does not connect one of the effects to society, economy, or culture</li> </ul>
	<p><b>The response earned the point for this row.</b> The response states how the beneficial effect relates to the society: "When looking at the GPS's ability to track children, this becomes a huge benefit to society. It betters the safety for children nowadays. If they get lost, a parent can easily use their iPhone to track their location. Also, if parents see that their child is heading towards somewhere that is potentially dangerous, they can prevent the child from getting in trouble."</p>	

2d. Using specific details, describe:

- the data your innovation uses;
- how the innovation consumes (as input), produces (as output), and/or transforms data; and
- at least one data storage concern, data privacy concern, or data security concern directly related to the computing innovation.

(Must not exceed 250 words)

Student Response	Scoring Guidelines	
<p>According to Fred Zahradnik in his Lifewire article, GPS takes in data signals from several satellites that are in orbit around the Earth. Using these signals, a GPS can pinpoint your exact or relative location. In general, the data it produces is the location, but depending on which specific device you are using at the time, the location can be used to figure out other things, like directions, speed, and more. However, there can be some serious security concerns when it comes to using GPS. According to Catherine Rump, the government can track people's locations through their cell phone use. Every minute or so phones registers its location with the cell phone networks, allowing data to be easily available to when you might be. Also, when you use GPS on your phone, such as google maps, the government can monitor where you go and what you are doing. It is pretty invasive, but it is very difficult to avoid and the government can use it as a helpful tool to track criminals. (172)</p>	Row and Task	Decision Rules
	<p><b>Row 6 Response 2D</b></p> <ul style="list-style-type: none"> <li>• Identifies the data that the identified or described computing innovation uses AND</li> <li>• Explains how that data is consumed, produced, OR transformed.</li> </ul>	<p>Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the described innovation is not a computing innovation;</li> <li>• the response does not state the specific name of the data or simply says "data";</li> <li>• the response confuses or conflates the innovation with the data: response fails to explain what happens to the data; or</li> <li>• the response confuses the source of the data with the data.</li> </ul>
	<p><b>The response earned the point for this row.</b></p> <p>The response identifies the data being used as "data signals from several satellites that are in orbit around the Earth.... In general, the data it produces is the location." It states that these locations can be used to "figure out other things, like directions, speed, and more," which indicates how data is consumed.</p>	
	<p><b>Row 7 Response 2D</b></p> <ul style="list-style-type: none"> <li>• Identify one data storage, data privacy, OR</li> <li>• data security concern related to the identified or described computing innovation.</li> </ul>	<p>Responses should be evaluated on the rationale provided in the response not on the interpretation or inference on the part of the scorer. Responses can earn this point even if they refer to the data in a general without specifically identifying the data being used.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the described innovation is not a computing innovation; or</li> <li>• the response identifies or describes a concern that is not related to data</li> </ul>
<p><b>The response earned the point for this row.</b></p> <p>The data security concern cited is: "However, there can be some serious security concerns when it comes to using GPS. According to Catherine Rump, the government can track people's locations through their cell phone use."</p>		

## References

2e. Provide a list of at least three online or print sources used to create your computational artifact and/or support your responses through in-text citation to the prompts provided in this performance task.

- At least two of the sources must have been created after the end of the previous academic year.
- For each online source, include the complete and permanent URL. Identify the author, title, source, the date you retrieved the source, and, if possible, the date the reference was written or posted.
- For each print source, include the author, title of excerpt/article and magazine or book, page number(s), publisher, and date of publication.
- If you include an interview source, include the name of the person you interviewed, the date on which the interview occurred, and the person's position in the field.
- Include in-text citations for the sources you used.
- Each source must be relevant, credible, and easily accessed.

Student Response	Scoring Guidelines	
<p>"0 Free Illustrations: Satellite." Satellite - Free Illustrations on Pixabay. N.p., n.d. Web. 05 Dec. 2016. &lt;<a href="https://pixabay.com/en/photos/satellite/?image_type=illustration">https://pixabay.com/en/photos/satellite/?image_type=illustration</a>&gt;.</p> <p>Bajaj, Karan. "How to Use GPS to Locate Things and Track People - The Economic Times." The Economic Times. N.p., n.d. Web. 05 Dec. 2016. &lt;<a href="http://economictimes.indiatimes.com/wealth/spend/how-to-use-gps-to-locate-things-and-track-people/articleshow/55386722.cms">http://economictimes.indiatimes.com/wealth/spend/how-to-use-gps-to-locate-things-and-track-people/articleshow/55386722.cms</a>&gt;.</p> <p>"Buy Products Online from China Wholesalers at Aliexpress.com." Buy Products Online from China Wholesalers at Aliexpress.com. N.p., n.d. Web. 05 Dec. 2016. &lt;<a href="https://www.aliexpress.com/popular/iphone-tracking-apps.html">https://www.aliexpress.com/popular/iphone-tracking-apps.html</a>&gt;.</p> <p>Rump, Catherine. "How GPS Tracking Threatens Our Privacy." CNN. Cable News Network, 07 Nov. 2011. Web. 07 Dec. 2016.</p> <p>"Course Correction: Navigating a More Cost-Effective Path to GPS Modernization." The MITRE Corporation. N.p., n.d. Web. 05 Dec. 2016. &lt;<a href="https://www.mitre.org/publications/project-stories/course-correction-navigating-a-more-costeffective-path-to-gps-modernization">https://www.mitre.org/publications/project-stories/course-correction-navigating-a-more-costeffective-path-to-gps-modernization</a>&gt;.</p> <p>"General Information On GPS." General Information On GPS. N.p., 8 Sept. 2016. Web. 05 Dec. 2016. &lt;<a href="http://www.navcen.uscg.gov/?pageName=gpsmain">http://www.navcen.uscg.gov/?pageName=gpsmain</a>&gt;.</p> <p>"Gps+navigating - Google Search." Gps+navigating - Google Search. N.p., n.d. Web. 05 Dec. 2016. &lt;<a href="https://www.google.com/search?q=gps%2Bnavigating&amp;espv=2&amp;biw=1366&amp;bih=662&amp;">https://www.google.com/search?q=gps%2Bnavigating&amp;espv=2&amp;biw=1366&amp;bih=662&amp;</a></p>	Row and Task	Decision Rules
	<p><b>Row 8 Response 2E &amp; Artifact</b></p> <p>References, through in-text citation, at least 3 different sources.</p>	<p>The in-text citations can be in either the artifact or the written response. The in-text citations may be oral in the computational artifact.</p> <p><b>Do NOT award a point if any one of the following is true:</b></p> <ul style="list-style-type: none"> <li>• the response contains a list of sources only, no in-text citations;</li> <li>• the response contains less than three in-text citations; or</li> <li>• there are fewer than three sources cited, even if there are three or more in-text citations.</li> </ul>
<p><b>The response earned the point for this row. This response uses the authors' names as in-text citations</b> (see responses 2a-d) of at least three attributed sources.</p>		

source=Inms&tbm=isch&sa=X&ved=0ahUKEwiDnIGYydXQAhUIZCYKHSA0Do8Q\_AUICCGD#imgrc=iwmTck2WV1IDvM%3A>.

N.p., n.d. Web. <<https://www.streamliningip.com/track-kids-gps-watch/>>.

"Petslady.com." Petslady.com. N.p., 24 Oct. 2016. Web. 05 Dec. 2016.  
<[http://petslady.com/articles/5\\_best\\_pet\\_tracking\\_systems\\_dog\\_and\\_cat\\_owners\\_60624](http://petslady.com/articles/5_best_pet_tracking_systems_dog_and_cat_owners_60624)>.

"Redirect Notice." Redirect Notice. N.p., n.d. Web. 05 Dec. 2016.  
<<https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=0ahUKEwi3wPrVy9XQAhVC5CYKHcWhDUIQjhwIBQ&url=http%3A%2F%2Fwww.theaustralian.com.au%2Flife%2Ftracks-tile-and-duet-help-you-find-your-keys-andwallet%2Fstory-e6frg9zo-1226959598917&bvm=bv.139782543%2Cd.eWE&psig=AFQjCNH51ZFBh7jdbGS6buTFdjMsMiLvlw&ust=1480770892368270>>.

Yackulic, Chris. "Military Tactical Handset Running Android." AndroidHeadlines.com |. N.p., 05 Dec. 2016. Web. 05 Dec. 2016.  
<<http://www.androidheadlines.com/2010/08/militarytactical-handset-running-android.html>>.

Zahradnik, Fred. "The Technology That Makes GPS Satellite-Based Navigation System Work." Lifewire. N.p., 16 Oct. 2016. Web. 05 Dec. 2016.  
<<https://www.lifewire.com/how-gpsworks-1683296>>.

# **Unit 6 Lesson 2**

**Explore PT: Make a Plan (1 hr)**

**Resources**

## Computing Innovation Brainstorm Activity (10 mins)

- Place a  $\checkmark$  next to at least 3 innovations you think are *definitely* a good choice for the explore PT
- Place a **X** next to at least 3 that are *definitely NOT* a good choice for the Explore PT
- Start to jot down your own ideas for Computing Innovations you might want to use for the Explore PT

$\checkmark$ / X	“Innovations” / topics	<b>Your Ideas for computing innovations to use for the Explore PT</b> Note: you can use one of, or some aspect of, the items in the list for your own task.
?	Self-driving car	
X	Fiber-optic cable	
X	TCP Protocol	
?	Smart watch	
$\checkmark$	Music Recommendation App (e.g. Pandora)	
X	Bluetooth speakers	
X	Digital clock	
?	Backup camera on a car	
$\checkmark$	Facial recognition software	
X	Email	
?	Laptop computer	
$\checkmark$	A system for digitizing and sharing medical records	
X	Wireless phone charging	
$\checkmark$	Instagram	
?	Police body cameras	
?	3D Printer	
$\checkmark$	Bitcoin	
?	Google glasses	
$\checkmark$	Snapchat	
?	GPS	
$\checkmark$	A phone app	
$\checkmark$	Video streaming service (e.g. Netflix)	

$\checkmark$	Probably a good choice. It's software with well known social implications
X	Probably a bad choice. It's hardware or just simply not actually a computational thing. Some hardware might be able to be finessed into a computing innovation if you can find the software that drives it or processes the data it collects or works with. It can lead to some tricky situations for an exam reader though.
?	Maybe a good choice assuming you focus on the actual computational part for all aspects of the task and not simply the broader technology itself.  Some of these can be turned into great topics for the explore PT if done right.

### Notes:

- Many innovations you've studied or read about in this class are not good choices.
- Assume you'll need to do quick research on a few ideas before you land on an actual topic for this task.
- A common pitfall is to choose a technological innovation without identifying the computational aspect of it. For example: a self-driving car is a technological innovation. But a good choice for the performance task is to identify a particular aspect of a self-driving car that clearly involves computing.
- Hardware is often a gotcha - make sure you can identify the computing part.

# Brainstorm: harmful effects v. data security concerns (10 mins)

One of the challenging things about the Explore PT in doing research is distinguishing between a Harmful Effect and a Data Security Concern. Computing innovations can lead to “bad stuff” happening but for the Explore PT is it a harmful effect or data storage, privacy, security concern? Here’s how to think about it:

## Harmful effects on society, economy, culture

Translation: *what are the unintended consequences of this innovation on specific groups of people assuming the innovation works as intended? For harmful effect: who or what stands to lose from wide use of this innovation now, or in the future?*

V.

## Data storage, privacy, or security concern

Translation: *What are the risks? How could the data be misused? What are the security or privacy risks?*

**Activity:** Here’s a list of “bad” stuff resulting from computing innovations. Identify which is a harmful effect and which is a data storage/security/privacy concern (following the Explore PT definitions)?

“Bad stuff” from computing	Harm	Data
Autonomous cars must constantly collect and store data about their location. Hacking this information could allow attackers to remotely track where drivers travel.		√
Autonomous cars will displace thousands or even millions of people currently employed as bus, taxi, and truck drivers.	√	
Digitizing and moving medical records online makes it significantly easier for attackers to access personal information about almost anyone in the country / world.		√
Music recommendation systems may inadvertently direct listeners towards a more narrow selection of music, decreasing the diversity of our cultural output and consumption.	√	
The growing use of facial recognition software makes it increasingly challenging to navigate society anonymously.	√	
Online advertising is so individualized that we can now operate within our own “filter bubbles”. For example political discussion suffers as it becomes challenging to communicate based on a set of shared experiences or pieces of information.	√	
Data about things that you have "Liked" online can be used to make reasonable guesses about your age, gender, location, and many other pieces of personal information.		√
Car sharing apps like Uber or Lyft have contributed to a class of workers who may work full time but do not enjoy the typical social and economic benefits typically associated with full time work.	√	
Your location history in a mapping app can allow someone to know where you live, go to school, or spend time.		√

## Rapid Research Activity - Harmful Effects (10 mins)

Now that you have a sense of what a harmful effect is you will practice doing some rapid research to see if you can quickly identify a harmful effect for some innovation. Remember that for the harmful effect you should:

- Assume the innovation is being used or works as intended
- Identify the impact on society, economy or culture
- Identify a specific group of people who are impacted

**Research Tips:** Since you need to identify harmful effects to specific elements of society and people, you might kick off your research by searching for things like:

- “The unintended consequences of \_\_\_\_\_”
- “pros and cons of \_\_\_\_\_”
- “the downsides of \_\_\_\_\_”
- “\_\_\_\_\_ economic impacts”

Rapid Research: Harmful Effects	
<p><i>Pick one of the computing innovations from the Computing Innovation Brainstorm Activity (either from the list or one that you wrote down) and see how quickly you can find a harmful effect that will work for the Explore PT. Fill in the table below with what you found</i></p>	
<p><b>Computing Innovation:</b></p>	
<p><b>Harmful Effects I found:</b></p>	<p><b>Group of people of people affected:</b></p>
<p>Is this primarily an impact on...    <input type="checkbox"/> <b>Society</b>    <input type="checkbox"/> <b>Economy</b>    <input type="checkbox"/> <b>Culture</b></p>	
<p><b>Search Terms I used:</b></p>	<p><b>Sites / Articles I found:</b></p>

**Notes on groups of people, society, economy, culture:**

- **culture** - can be thought of as a group of people: example – football players are a culture, students that have asthma are a culture
- **economy** - can be thought of as a group of people with similar economic interests, or whose jobs or or industry are similar. Example: (Netflix put companies like Blockbuster and rental places out of business)
- **society** - try to avoid “society”. It’s too broad. Get specific: Which society? Whose society?

## Explore PT Planning Organizer

Innovation Name:

Facts about purpose and function:

Response 2a  
Row 2

Artifact Planning Ideas:

Explain one effect of the innovation.

Response 2c  
Row 3

Explain one beneficial effect  
(and the group affected,  
provide source)

Response 2c  
Row 4, 5

Explain one harmful effect.  
(and the group affected,  
provide source)

Response 2c  
Row 4, 5

Description of data used by innovation (specific type; describe how below)

Response 2d  
Row 6

Input (consume)

Row 6

Process (transform)

Row 6

Output (produce)

Row 6

Computational Artifact  
Row 7

How does the artifact illustrate represent OR explain the innovation's purpose, function or effect?

Explain one data storage, privacy or security concern from misuse of innovation and/or its data

Response 2d  
Row 7

References:

- 1)
- 2)
- 3)

Response 2e  
Row 8

# Explore PT Completion Timeline

Before you start you should think about how you are going to allocate your time for 8 hours provided for the task. Below is a sample timeline that you can use to plan out how you will complete the Explore Performance Task.

Hour	Suggested Activity	Your Plan
1	Brainstorm ideas for computing innovations <ul style="list-style-type: none"> <li>Do rapid research to decide what to do</li> <li>Use the Explore PT Planning Organizer</li> </ul> <b>Goal:</b> By the end of this day you should know what your innovation is and most of the sources you will cite	
2	Research and draft responses for prompts 2c, 2d: <ul style="list-style-type: none"> <li>Use the Explore PT Organizer</li> <li><b>2c</b> - Beneficial and Harmful Effects</li> <li><b>2d</b> - How it uses data + security concern</li> </ul>	
3	Continue work from Day 2 <b>Goal:</b> Finish responses <b>2c</b> and <b>2d</b>	
4	Create the computational artifact <ul style="list-style-type: none"> <li>Use the PT Organizer to sketch an idea</li> <li><b>Goal:</b> know what you're going to make for artifact and start it.</li> </ul>	
5	<ul style="list-style-type: none"> <li>Continue work on computational artifact</li> <li>Draft response to <b>2a</b> - Intended purpose or function of innovation.</li> </ul>	
6	Continue Comp. Artifact + <b>2a</b> <b>Goal:</b> Finish Comp. Artifact and response <b>2a</b>	
7	Review, clean up, touch up <ul style="list-style-type: none"> <li>Complete <b>2e</b> - References</li> <li>Complete Response <b>2b</b></li> <li>Make sure you have source cited for any fact or claim in <b>2a, 2c, 2d</b></li> </ul>	
8	Complete the task <ul style="list-style-type: none"> <li>Review the submission materials</li> <li>Check your responses against the scoring guidelines</li> <li>Enter your responses into the digital portfolio</li> <li>Upload your computational artifact (and/or PDF of written responses to the the digital portfolio)</li> </ul> <b>Goal:</b> At the end of this day, your Explore PT is submitted!	

**Note:** The timeline above is just a guideline. You may complete the performance task on a different schedule. Make sure to leave enough time to complete your computational artifact and write-up.

## Explore PT Overview

**Goal of the Task:** Explore through research, then explain and represent the impact, function, and societal effects of a computing innovation.

**What you Submit:** (1) Computational Artifact (2) Written Responses to prompts 2a-e (with citations of sources for where you found the information).

**How you get a good score:** The AP committee wants to see that you can:

- identify a computing innovation
- demonstrate a basic understanding of how it works
- discuss the positive and negative effects this computing innovation on society
- cite those things with articles or other texts you found doing research.

**Suggested Process in a Nutshell** (see also: Sample Timeline on following pages):

- 1. Pick a good innovation...**
  - Make a list of potential computing innovations to use for the task (see below)
  - Do some “rapid research” to see if you can quickly figure out if its a good one to use for the task (criteria below)
  - Pick an innovation that works well and start the task!
- 2. Do rapid research to find your answers for written prompts...**
  - Beneficial and harmful effects of the innovation on society, economy, culture (prompt 2c)
  - How it consumes, produces, or transforms data (prompt 2d)
  - Data storage, privacy, or security concern (prompt 2d)
- 3. Make your computational artifact**
  - Make something that represents your responses to 2a and 2d
- 4. Finalize written responses and submit!**

## Picking a good Computing Innovation

**Make your life easier:** Choosing a good computing innovation from the outset will make completing the task easy. Choosing something that you’re interested in and motivated to learn more about will also help. Do this by ensuring two things *before* you fully commit:

- (1) You have identified an *actual* computing innovation
- (2) You have a good idea of how to respond to the written responses about your innovation.

**Evaluate Computing Innovations by asking these questions:**

<b>1. Does it use data?</b> (input, transform, output)	<b>2. Can I identify a group it impacts?</b> (both positively and negatively)	<b>3. Can I find published references about it?</b>
---	--	---

If you can answer “yes” to these three questions you’ve likely identified a true computing innovation that will work well for the task. **Remember:** if the innovation is not a true computing innovation, you can only earn 1 point for the ENTIRE task. **CHOOSE YOUR INNOVATION WISELY!**

<sup>1</sup> Much of the content of this this guide was borrowed and/or modified with permission from Jill Westerlund at the [Abstracting CS](#) blog. We are grateful for Jill’s ingenuity and generosity.

## Computing Innovation Brainstorm Activity (10 mins)

- Place a  $\checkmark$  next to at least 3 innovations you think are *definitely* a good choice for the explore PT
- Place a **X** next to at least 3 that are *definitely NOT* a good choice for the Explore PT
- Start to jot down your own ideas for Computing Innovations you might want to use for the Explore PT

√ / X	“Innovations” / topics	<b>Your Ideas for computing innovations to use for the Explore PT</b> Note: you can use one of, or some aspect of, the items in the list for your own task.
	Self-driving car	
	Fiber-optic cable	
	TCP Protocol	
	Smart watch	
	Music Recommendation App (e.g. Pandora)	
	Bluetooth speakers	
	Digital clock	
	Backup camera on a car	
	Facial recognition software	
	Email	
	Laptop computer	
	A system for digitizing and sharing medical records	
	Wireless phone charging	
	Instagram	
	Police body cameras	
	3D Printer	
	Bitcoin	
	Google glasses	
	Snap Chat	
	GPS	
	A phone app	
	Video streaming service (e.g. Netflix)	

After you've finished, compare your list with a friend and discuss.

### Notes:

- Many innovations you've studied or read about in this class are not good choices.
- Assume you'll need to do quick research on a few ideas before you land on an actual topic for this task.
- A common pitfall is to choose a technological innovation without identifying the computational aspect of it. For example: a self-driving car is a technological innovation. But a good choice for the performance task is to identify a particular aspect of a self-driving car that clearly involves computing.
- Hardware is often a gotcha - make sure you can identify the computing part.

# Brainstorm: harmful effects v. data security concerns (10 mins)

One of the challenging things about the Explore PT in doing research is distinguishing between a harmful effect and a data security/privacy concern. Computing innovations can lead to “bad stuff” happening but how do you know if it’s a harmful effect or data storage, privacy, security concern? Here’s how to think about it for the Explore PT:

## Harmful effects on society, economy, culture

Translation: *what are the unintended consequences of this innovation on specific groups of people assuming the innovation works as intended? For harmful effect: who or what stands to lose from wide use of this innovation now, or in the future?*

V.

## Data storage, privacy, or security concern

Translation: *What are the risks? How could the data be misused? What are the security or privacy risks?*

**Activity:** Here’s a list of “bad stuff” resulting from computing innovations. Identify which is a harmful effect and which is a data storage/security/privacy concern (following the Explore PT definitions).

“Bad stuff” from computing	Harm	Data
Autonomous cars must constantly collect and store data about their location. Hacking this information could allow attackers to remotely track where drivers travel.		
Autonomous cars will displace thousands or even millions of people currently employed as bus, taxi, and truck drivers.		
Digitizing and moving medical records online makes it significantly easier for attackers to access personal information about almost anyone in the country / world.		
Music recommendation systems may inadvertently direct listeners towards a more narrow selection of music, decreasing the diversity of our cultural output and consumption.		
The growing use of facial recognition software makes it increasingly challenging to navigate society anonymously.		
Online advertising is so individualized that we can now operate within our own “filter bubbles”. For example political discussion suffers as it becomes challenging to communicate based on a set of shared experiences or pieces of information.		
Data about things that you have "Liked" online can be used to make reasonable guesses about your age, gender, location, and many other pieces of personal information.		
Car sharing apps like Uber or Lyft have contributed to a class of workers who may work full time but do not enjoy the typical social and economic benefits typically associated with full time work.		
Your location history in a mapping app can allow someone to know where you live, go to school, or spend time.		

After you’ve finished, compare and discuss with a partner.

## Rapid Research Activity - Harmful Effects (15 mins)

Now that you have a sense of what a harmful effect is you will practice doing some rapid research to see if you can quickly identify a harmful effect for some innovation. Remember that for the harmful effect you should:

- Assume the innovation is being used or works as intended
- Identify the impact on society, economy or culture
- Identify a specific group of people who are impacted

**Research Tips:** Since you need to identify harmful effects to specific elements of society and people, you might kick off your research by searching for things like:

- “The unintended consequences of \_\_\_\_\_”
- “pros and cons of \_\_\_\_\_”
- “the downsides of \_\_\_\_\_”
- “\_\_\_\_\_ economic impacts”

Rapid Research: Harmful Effects	
<p><i>Pick one of the computing innovations from the Computing Innovation Brainstorm Activity (either from the list or one that you wrote down) and see how quickly you can find a harmful effect that will work for the Explore PT. Fill in the table below with what you found</i></p>	
<p><b>Computing Innovation:</b></p>	
<p><b>Harmful Effects I found:</b></p>	<p><b>Group of people of people affected:</b></p>
<p>Is this primarily an impact on...    <input type="checkbox"/> <b>Society</b>    <input type="checkbox"/> <b>Economy</b>    <input type="checkbox"/> <b>Culture</b></p>	
<p><b>Search Terms I used:</b></p>	<p><b>Sites / Articles I found:</b></p>

**Notes on groups of people, society, economy, culture:**

- **culture** - can be thought of as a group of people: example – football players are a culture, students that have asthma are a culture
- **economy** - can be thought of as a group of people with similar economic interests, or whose jobs or or industry are similar. Example: (Netflix put companies like Blockbuster and rental places out of business)
- **society** - try to avoid “society”. It’s too broad. Get specific: Which society? Whose society?

## Explore PT Planning Organizer

Innovation Name:

Facts about purpose and function:

Response 2a  
Row 2

Artifact Planning Ideas:

Explain one effect of the innovation.

Response 2c  
Row 3

Explain one beneficial effect  
(and the group affected,  
provide source)

Response 2c  
Row 4, 5

Explain one harmful effect.  
(and the group affected,  
provide source)

Response 2c  
Row 4, 5

Description of data used by innovation (specific type; describe how below)

Response 2d  
Row 6

Input (consume)

Row 6

Process (transform)

Row 6

Output (produce)

Row 6

Computational Artifact  
Row 1

How does the artifact illustrate represent OR explain the innovation's purpose, function or effect?

Explain one data storage, privacy or security concern from misuse of innovation and/or its data

Response 2d  
Row 7

References:

- 1)
- 2)
- 3)

Response 2e  
Row 8

# Explore PT Completion Timeline

Before you start, you should think about how you are going to allocate your time for the 8 hours provided for the task. Below is a sample timeline that you can use to plan out how you will complete the Explore Performance Task.

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2	Research and draft responses for prompts 2c, 2d: <ul style="list-style-type: none"> <li>Use the Explore PT Organizer</li> <li><b>2c</b> - Beneficial and Harmful Effects</li> <li><b>2d</b> - How it uses data + security concern</li> </ul>	
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4	Create the computational artifact <ul style="list-style-type: none"> <li>Use the PT Organizer to sketch an idea</li> <li><b>Goal:</b> know what you're going to make for artifact and start it.</li> </ul>	
5	<ul style="list-style-type: none"> <li>Continue work on computational artifact</li> <li>Draft response to <b>2a</b> - Intended purpose or function of innovation.</li> </ul>	
6	Continue Comp. Artifact + <b>2a</b> <b>Goal:</b> Finish Comp. Artifact and response <b>2a</b>	
7	Review, clean up, touch up <ul style="list-style-type: none"> <li>Complete <b>2e</b> - References</li> <li>Complete Response <b>2b</b></li> <li>Make sure you have source cited for any fact or claim in <b>2a, 2c, 2d</b></li> </ul>	
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**Note:** The timeline above is just a guideline. You may complete the performance task on a different schedule. Make sure to leave enough time to complete your computational artifact and write-up.

# Written Response Templates

**Prompt 2a.** Provide information on your computing innovation and computational artifact.

- Name the computing innovation that is represented by your computational artifact.
- Describe the computing innovation’s intended purpose and function.
- Describe how your computational artifact illustrates, represents, or explains the computing innovation’s intended purpose, its function, or its effect.

*(Must not exceed 100 words)*

**Advice:** This prompt requires you to state multiple pieces of information in only 100 words. Keep each section short and consider using a bulleted list.

Purpose and function are not the same. The purpose is the goal or objective that the innovation is designed to accomplish. The function is how the innovation accomplishes the purpose. The function is the actual “computing” done by the innovation, as in how it consumes, produces, or transforms data, to accomplish the purpose. Features of an innovation alone like “faster speeds” or “bigger screens” often do not fit well in either category.

Your computational artifact should should speak to and clarify the purpose or function of the innovation in some way, preferably with diagrams, images, or in other primarily non-textual ways. This written response should explain HOW your computational artifact goes about this.

You should cite references used for these responses, in particular the purpose and function of your innovation which were likely important parts of your research.

## Potential Research Terms

- “How it works: \_\_\_\_\_”
- “The science behind \_\_\_\_\_”
- “The history of \_\_\_\_\_”
- “How does \_\_\_\_\_ work?”

***Draft Your Response Here:***

*Name of innovation:*

*Purpose:*

*Function:*

*Computational Artifact Purpose:*

*(must not exceed 100 words)*

## 2a. Response Checklist

- Name of Computing Innovation
- The purpose of innovation - the intended goal or objective of the innovation
- The function of innovation - how the innovation works (for example, consumes and produces data)
- How artifact describes purpose, function and / or effect of the innovation
- Not exceed 100 words
- Cite any references used

**2b.** Describe your development process, explicitly identifying the computing tools and techniques you used to create your artifact. Your description must be detailed enough so that a person unfamiliar with the tools and techniques will understand your process

*(Must not exceed 100 words)*

**Advice: NOTE: This response is not scored,** but you can use this section to cite any sources used in the creation of your computational artifact.

- All images, diagrams, or information that appears in your computational artifact and that you yourself did not make should appear both in your citations and within this response.
- Also, by briefly describing the tool used to make the artifact and how you went about it can further help verify that you are the author of your artifact and did not merely submit someone else's work.

***Draft Your Response Here:***

*Tool Used:*

*Quick Summary of Process:*

*Cite Sources in Computational Artifact:*

*(must not exceed 100 words)*

**2b. Response Checklist**

- Describe the tool you used
- Describe the development process
- Mention if it's a new artifact or combining artifacts
- Cite sources for artifacts used
- Must not exceed 100 words

2c. Explain at least one beneficial and one harmful effect the computing innovation has had, or has the potential to have, on society, economy, or culture.

(Must not exceed 250 words)

**Advice:** Usually the beneficial effect is easy to identify - it's often the reason the innovation was created in the first place. A "harmful effect" should be an *unintended consequence* of the innovation being used the *way it was intended*. Focus on how the innovation, even when used correctly, will negatively impact some group of people, either culturally or economically. And cite sources to back up these claims.

Understand and focus on society/economy/culture (think about a group of people who may be impacted):

- **culture** - can be thought of as a group of people: example – football players are a culture, students that have asthma are a culture
- **economy** - can be thought of as a group of people with similar economic interests, or whose jobs or industry are similar. Example: (Netflix put companies like Blockbuster and rental places out of business)
- **society** - try to avoid saying "impacts to society...". It's too broad. Get specific: Which society? Whose society?

Data security and privacy concerns are NOT "harmful effects" by this definition. The fact that autonomous cars, online banking, or social media can be hacked is NOT an example of a harmful effect since these are examples of the innovations being used differently than they were intended.

You also must explicitly use the terms "beneficial" and "harmful" (or words close to those) in your response. Do not make the grader guess - just directly state the benefits and harms and the groups affected. You must explicitly tie each effect to a group of people and say what the effect is on society, economy, or culture.

**Research Tip:** Since you need to identify the beneficial and harmful effects to specific elements of society and people, you might kick off your research by searching for things like:

- "The unintended consequences of \_\_\_\_"
- "pros and cons of \_\_\_\_"
- "the downsides of \_\_\_\_"
- "\_\_\_\_ economic impacts"
- "The ethics of \_\_\_\_"
- "Legal concerns about \_\_\_\_"

NOTE: you may find articles with these searches that are also a fit for security concerns below.

**Draft Your Response Here:**

*Beneficial Effect:*

*Who's Impacted:*

*Society / Economy / Culture and How:*

*Harmful Effect:*

*Who's Impacted:*

*Society / Economy / Culture and How:*

(must not exceed 250 words)

### 2c. Response Checklist

- Use maximum of 250 words. (Try 2 paragraphs: 1 for the beneficial and 1 for the harmful effect)
- Clearly stated one beneficial effect AND one harmful effect
  - Why it is a beneficial or harmful effect
  - Who (the group) benefiting or being harmed
- Is the harm \*really\* a data security/privacy/concern? If so, rethink.
- DO NOT USE THESE for harmful or beneficial effects: (1) Hacking (2) Cost (3) Your personal opinion
- Cite your sources for where you found the beneficial and harmful effects.

**2d.** Using specific details, describe:

- The data your innovation uses;
- How the innovation consumes (as input), produces (as output), and/or transforms data; and
- At least one data storage concern, data privacy concern, or data security concern directly related to the computing innovation.

*(Must not exceed 250 words)*

**Advice:** If you have identified an actual computing innovation, then it's using data somehow — you just need to describe it. Think: what is actually being computed here? Think about or find through research: at the deepest level, what is the actual data (the actual numbers) that the innovation uses to do its thing? Don't just say what data is collected or how it's collected, but describe how it *uses* the data and *what it does with the data*, what it *computes* to achieve some effect. Your response should allow a reader to fill in the blanks: *it takes this \_\_\_\_\_ data, and does \_\_\_\_\_ to produce \_\_\_\_\_.*

Avoid describing the *device* that captures data. A camera is not data. A digital image is. You don't necessarily need to know the format of the data.

For a data security concern, think: what could happen if this data fell into the wrong hands, or were used for something besides the intended use. Could individuals be identified without their knowing it? Could someone or some organization in possession of all this data do something bad with it?

### Research Tips

For how it uses data try searching:

- "How it works: \_\_\_\_\_"
- "How does \_\_\_\_\_ work"
- "The science behind \_\_\_\_\_"

For security concerns try searching:

- "\_\_\_\_\_ and your privacy (or security)"
- "Risks of using \_\_\_\_\_"

***Draft Your Response Here:***

*The data the innovation uses:*

*How/what does it "compute" (something like: it takes this \_\_\_\_\_ data, does this \_\_\_\_\_ to produce \_\_\_\_\_)*

*A security/privacy/storage concern is:*

*(must not exceed 250 words)*

### 2d. Response Checklist

- Describe the data the innovation uses (make sure that the data used by the innovation is actually digital / numeric)
- Describe how the innovation "computes" in terms of the data it uses.
- Describe one data security, data privacy, or data storage concern
- Cite a source for where you found info about (1) how it works (2) security concern
- 250 word limit

## Computational Artifact

Your computational artifact must provide an illustration, representation, or explanation of the computing innovation's intended purpose, its function, or its effect. The computational artifact must not simply repeat the information supplied in the written responses and should be primarily nontextual. Submit a video, audio, or PDF file.

Use computing tools and techniques to create one original computational artifact (a visualization, a graphic, a video, a program, or an audio recording). **Acceptable multimedia file types include .mp3, .mp4, .wmv, .avi, .mov, .wav, .aif, or .pdf format. PDF files must not exceed three pages. Video or audio files must not exceed 1 minute in length and must not exceed 30MB in size.**

**Advice:** The reality is that the computational artifact is a media artifact that you make on a computer that helps communicate information about what the innovation is and how it works. It doesn't need to be a static image/graphic but that's certainly the easiest and fastest thing to create and you need to consider time for this task. Try to capture the purpose *and* the functionality with whatever you create. At the very least, you should demonstrate what the innovation is or does, but you should be aiming to clarify the purpose and function of your innovation. You want to make something you can point to for your selected innovation, and say: *here is what it is, here is what it does, and here is how it works.*

**Definition of Computational Artifact from the scoring guidelines:** *A computational artifact is something created by a human using a computer and can be, but is not limited to, a program, an image, an audio, a video, a presentation, or a Web page file. The computational artifact could solve a problem, show creative expression, or provide a viewer with new insight or knowledge.*

### A strong artifact will represent your written responses to 2a and 2d.

- In **2a** you describe the innovation's purpose - think: how can I represent that visually? (or with audio, video, etc.)
- In **2d** you describing how the innovation uses data, which is *really* describing its function - think: how can I represent that visually (or with audio, or video, etc.)
- After you make your artifact you can refer to it from your responses to 2a and 2d if that would help strengthen your explanation.

### A few different types of artifacts

- Create a simple diagram, infographic, or flowchart that clarifies the way your innovation works
- Make a simple chart of information about your innovation
- Find (and cite) images of your innovation being used in a variety of contexts
- Make an animation or video using screen capture that demonstrates the purpose and function of the innovation
- Make a 3-slide (3 page) presentation that you either capture on screen, or submit as PDF
- Make a 1-minute "podcast" about your innovation.

## Computational Artifact Checklist:

- Name of innovation appears in the artifact
- Shows the purpose of the innovation
- Shows the function of the innovation
- Primarily non-textual (Labels on a diagram: ok. A slide with bullet list of text: not ok).
- Uses an acceptable file type. One of: .mp3, mp4, .wmv, .avi, .mov, .wav, .avi, .aif, or .pdf format.
  - PDF files must not exceed **3 pages** -- **Video** or audio files must not exceed **1 minute** in length
  - File is less than 30 Megabytes

### Tips on software

- If at all possible, stay away from a .wav file for audio because they tend to be larger files.
- Also stay away from .aif files because they often aren't readable on PC's without specific paid plugins.

**2e.** Provide a list of at least three online or print sources used to create your computational artifact and/or support your responses through in-text citation to the prompts provided in this performance task.

- At least two of the sources must have been created after the end of the previous academic year.
- For each online source, include the complete and permanent URL. Identify the author, title, source, the date you retrieved the source, and, if possible, the date the reference was written or posted.
- For each print source, include the author, title of excerpt/article and magazine or book, page number(s), publisher, and date of publication.
- If you include an interview source, include the name of the person you interviewed, the date on which the interview occurred, and the person's position in the field.
- Include in-text citations for the sources you used.
- Each source must be relevant, credible, and easily accessed.

**Advice:** It's most likely you're doing research on the web and you'll need to cite a bunch of websites as your sources. You can use any citation format you like, or prefer (especially if your teacher has a particular preferred style). We recommend listing citations as a numbered list with a standard MLA format that includes the website URL (see below for template in: *Draft Your Response Here*)

There are a number of websites out there that will generate citations for you, but just make sure they're actually including all the info you need. If you need to cite or print other sources, generally the format is roughly the same but you should look up a good way to do it. Here is a decent guide <http://www.bibme.org/mla> The task requires a minimum of 3 sources, but it shouldn't be hard to include more.

**Make sure** that after you created your numbered citation list, that you go back into your written responses and add the correct number at the end of a sentence or paragraph to indicate the source of the information. **You should cite any fact or claim** that you make in written responses. You may use the same source for some of these but there are roughly at least 6 claims you need to make *plus* anything included in your computational artifact:

- |   |                                   |
|---|-----------------------------------|
| 1. Purpose of the innovation                    | 5. How it uses data               |
| 2. Function of the innovation                   | 6. Data security/privacy concern  |
| 3. Beneficial effect (including group affected) | 7. Computational artifact sources |
| 4. Harmful effect (including group affected)    |                                   |

Wherever you state your claim in the written response you should have a citation at the end of the sentence or paragraph. Something like:

*This innovation has a potentially harmful economic impact for workers in the \_\_\_\_\_ industry because it encourages consumers to \_\_\_\_\_ rather than \_\_\_\_\_ [5]*

**Draft Your Response Here (MLA format sampled below):**

[1] Author's Last name, First name. "Title of Web Page." Title of Website, Publisher, Date published, URL. Date retrieved.

[2] Author's Last name, First name. "Title of Web Page." Title of Website, Publisher, Date published, URL. Date retrieved.

[3] Author's Last name, First name. "Title of Web Page." Title of Website, Publisher, Date published, URL. Date retrieved.

...

(no word or character limit)

### **2e. Response Checklist**

- You have at least 3 sources cited
- You've cited the source for *any* image or other element you used in your computational artifact (and list which ones in response 2b).
- You've included references to your sources from *within* the text of the written responses 2a-d where appropriate.

# **Unit 6 Lesson 3**

**Explore PT: Complete the Task (8 hours)**

**Resources**

# Explore PT - Teacher Guidelines for Completing the Through-Course Assessment



## Student Guidelines

### You must:

- be aware of the task, timeline, components and scoring criteria.

### It is recommended that students:

- follow a timeline and schedule for completing the performance task;
- seek clarification from your teacher or AP Coordinator pertaining to the task, timeline, components, and scoring criteria;
- seek clarification from your teacher or AP Coordinator regarding submission requirements;
- allow your own interests to drive your choice of computing innovation and program;
- as needed, seek assistance from your teacher or AP Coordinator in defining your focus and choice of topics;
- use relevant and credible sources to gather information about your computing innovation when completing the Explore performance task;
- seek assistance from your teacher resolve technical problems that impede work, such as a failing workstation or difficulty with access to networks, or help with saving or making movie;

### Students may not:

- submit work that has been revised, amended, or corrected by another individual, with the exception of cited program code;
- submit work from a practice performance task as your official submission to the College Board to be scored by the AP Program; or
- seek assistance or feedback on answers to prompts.

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## Administering the Task: Role of the Teacher

### Teachers must:

- provide 8 classroom hours to complete this task; and
- ensure students are aware of the task, timeline, components, and scoring criteria.

### To meet these requirements, it is recommended that teachers:

- suggest a timeline and schedule for students for completing the performance task and monitor students' progress;
- clarify directions for a component of a performance task when students do not understand the directions;
- remind students about submission requirements;
- allow students' interests to drive their choice of computing innovation;
- assist students in defining their focus and choice of topics prior to them beginning their investigation without making selections for them (e.g., by asking questions);
- remind students to use relevant and credible sources to gather information about their computing innovations;
- assist in resolving technical problems that impede work, such as a failing workstation or difficulty with access to networks, or to help with saving files;
- wait until after students' performance tasks have been completed and submitted to the AP Digital Portfolio before providing feedback on those tasks if they are being considered as part of the class grade;
- advise students that they may not revise their work once they have completed and submitted their work to the AP Digital Portfolio; and
- inform students that the scoring process that occurs in the AP Reading is different from the one that may be used in a classroom setting; the AP score that students receive may be different than their classroom grade.

# Explore PT - Teacher Guidelines for Completing the Through-Course Assessment



## Teachers may not:

- assign, provide, or distribute specific topics to students;
- write, revise, amend, or correct student work;
- allow students to submit computational artifacts from practice performance tasks as a submission for AP scoring; or
- suggest answers or provide feedback on answers to prompts.

## In addition, teachers should:

- Provide students with the meaning and purpose of creating a computational artifact. A computational artifact is a visualization, a graphic, a video, a program, or an audio recording that students create using a computer. The creation of an artifact could solve a problem, show creative expression, or provide the viewer with new insight or knowledge.
- Discuss the criteria for a well-chosen computing innovation (i.e., an innovation that depends on computing [or computing tools] to define its functionality).
- Guide students in clearly defining beneficial and harmful effects of various computing innovations.
- Inform students that a computing innovation that has a meaningful personal or community emphasis is an appropriate choice, as long as it fulfills the requirement to have an impact on society, economy, and culture.
- Provide instruction and multiple opportunities for students to practice searching and evaluating sources relevant to computing innovations. All sources cited must be relevant, credible, and easily accessible.
- Instruct students to ensure their written responses are based on relevant and credible sources. Students can search for print or nonprint sources as part of their investigation. In addition, students should ensure appropriate citation of sources being quoted in a written response. Students can reference a journal, Web page, or expert that is being quoted as part of a written response.
- Instruct students to ensure appropriate citation of sources used in the creation of their computational artifact. Sources that should be cited include images, graphs, and program code that are used in the creation of their artifact.
- Discuss the use of computational tools that can be used to create effective computational artifacts.
- Discuss artifacts that are effective and ineffective.