Unit 10 Lesson 1

Project - Innovation Simulation Part 1

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

Unit 10 contains an extended project that composes 7 of the 14 lessons in this unit. It serves a number of important goals:

1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

Lesson	Key Beats of the Lesson	Connection to the Project Guide	Other notes
U10L1: Project - Innovation Simulation Part 1	1. The teacher introduces the simulation and hands out “roles” to students. 2. Students explore what a computing innovation is and watch a video. 3. Students brainstorm innovations that might be useful to Future School. 4. Students reflect on their character’s role and what innovations their character might be most interested in.	Students finish Step 1 - Reflect of the Project Guide. The teacher models how to do Step 2 - Research of the Project Guide.	Students don’t do their own research on this day. That comes in the next lesson.
U10L2: Project - Innovation Simulation Part 2	1. The teacher hands out badges and nameplates from the previous lesson to get students into “simulation mode” 2. Students research three different computing innovations and discuss these innovations with team	Students finish Step 2 - Research of the Project Guide.	None.

	members.		
U10L3: Data Policies and Privacy *(Students do not work on the project during this lesson)*			
U10L4: The Value of Privacy *(Students do not work on the project during this lesson)*			
U10L5: Project - Innovation Simulation Part 3	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. The class watches a video about unintended consequences of computing innovations. 3. Students meet with their groups to discuss pros and cons of the different proposed innovations they researched in Step 2. 4. Students document the feedback they gave in Step 3 of the Activity Guide. 5. Students select one innovation which will ultimately become part of their groups’ vision for the Future School. 6. Students start to work on their One-pagers.	Students finish Step 3 - Feedback of the Project Guide. Students start Step 4 during this lesson. This step will be finished in U10L8.	This builds on previous lessons where students have considered ways that computing innovations may risk their privacy and have other unintended consequences. In future parts of this project, students will present their “vision” for the school of the future which includes each of these innovations that their team selects. Together, all of the innovations should help form a complete vision of what their team is proposing.
U10L6: Security Risks Part 1 *(Students do not work on the project during this lesson)*			
U10L7: Security Risks Part 2 *(Students do not work on the project during this lesson)*			
U10L8: Project - Innovation Simulation Part 4	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 4 in their Project Guide.	Students work on Step 4 - One-pager of the Project Guide. They should have most of it finished by the end of the lesson with the exception of the “Addressing Concerns” section which will be addressed later.	Students may leverage what they learned in U10L6 and U10L7 about security risks to identify “concerns” about their innovation in Step 4 of their Project Guide.
U10L9: Protecting Data Part 1 *(Students do not work on the project during this lesson)*			

U10L10: Protecting Data Part 2 *(Students do not work on the project during this lesson)*			
U10L11: Project - Innovation Simulation Part 5	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 5 in the Project Guide and put together a presentation focused on a theme for their vision for the Future School.	Students should mostly have Step 5 of the Project Guide done by the end of this lesson. They will get feedback on their presentation from Step 5 in the next lesson.	Students may leverage what they learned in U10L9 and U10L10 to finish the “Addressing Concerns” section of Step 4 of their Project Guide.
U10L12: Project - Innovation Simulation Part 6	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students break their group into smaller groups and present their ideas to a different small group. 3. Students give and get feedback from a different small group. 4. Students come back to their original groups and use the feedback they received to make changes to their presentations and one-pagers.	This is an opportunity for students to finish and revise any portions of Step 4 - One-pager and Step 5 - Preparing your Group Presentation in the Project Guide.	
U10L13: Project - Innovation Simulation Part 7	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students do short presentations of their proposals. 3. Students do a gallery walk to look at the proposals and the one-pagers other groups developed. 4. Students finish Step 7 in the Project Guide by voting for one “Overall Vision” and one “Innovation” that they felt was most compelling.	Students finish Step 6 and Step 7 of the Project Guide during this lesson.	Students should vote as their character. For example, if they were assigned a specific “Parent” role, they should vote as that parent. This is the last day of the simulation. Students will turn in their work at the end of the hour and turn in their name badges for the last time!
U10L14: Assessment Day *(Students do not work on the project during this lesson)*			

Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

Project Description

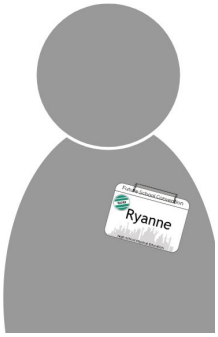
Welcome to the Future School Convention! You have been chosen to attend this convention because you represent an important stakeholder in the broader school community. Together with a small group you will brainstorm and research computing innovations that you believe will have a positive impact on schools. At the end of the convention, your team will pitch your best idea to a panel of judges.

Deliverables

- Individual:
  - This completed project guide
  - A computing innovation proposal
- Group:
  - An artifact displaying your team members' innovations
  - A presentation of the team's top innovation

Simulation

This project is a simulation where you and your classmates role play as delegates at a convention. There are times throughout this unit when you will be in simulation mode. Look for the red "Innovation Simulation" header at the top of slides as an indication of when the simulation is live. You should also wear your nametag and display your nameplate.



Step 1 - Reflection

My Character's Name	
My Role	
Consider what your character would want or need in a computing innovation for the Future School. Explain why.	

Step 2 - Research

Choose three different computing innovations you would like to recommend for the Future School. These can be innovations that were brainstormed as a team, or new ones that you think of. Check with your team to make sure no one is researching the same innovations.

Computing Innovation #1	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #2	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #3	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Step 3 - Feedback

In the space below record three pieces of feedback you gave to teammates about their proposed innovations and why you provided that feedback.

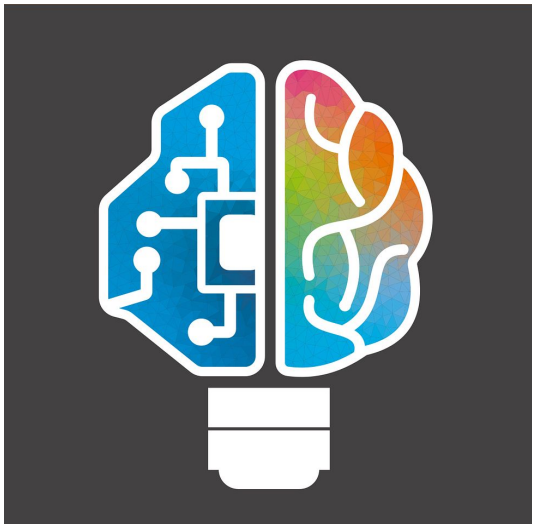
Innovation / Teammate	Feedback	Why You Gave It

Step 4 - One Pager

Based on the feedback you received, complete the one-pager on the next page for the innovation that best responds to your team's feedback and aligns with a unifying group theme or vision for the Future School.

Innovation One-Pager

<Name of the Innovation>



Replace the text above with the name of your innovation
Replace the image to the right with an image of your innovation

Purpose and Benefits
Write a paragraph or bullets explaining the reason the innovation exists. You should include:

- *The specific groups in the school community you believe would benefit*
- *The specific problems or challenge that group is facing*
- *The specific ways that group would benefit*
- *At least one specific reason your character would be interested in this innovation.*

Function
Write a paragraph or bullets explaining how the innovation actually works. You should include:

- *A high level description of how users interact with the innovation*
- *What data the innovation uses or collects*
- *How that data is processed and stored*

Concerns
Write a paragraph or bullets explaining potential concerns or risks posed by this innovation. You should include

- *At least one specific group that could potentially be harmed by the innovation and the way they could be harmed*
- *At least one specific privacy or security concern that arises from collecting the data needed to run your innovation.*

Addressing Concerns
Write a paragraph or bullets explaining the ways you could address potential concerns about your innovation. You should include:

- *Direct ties to the concerns raised in the previous paragraph*
- *At least one cybersecurity technique that could be used to make the innovation more secure*
- *Ways you would be willing to limit the innovation or alter its functionality to avoid the concerns*

Sources
List all sources that you used in making this project using the format below. Make sure to cite the source of your image.

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

Step 5 - Preparing Your Group Presentation

In addition to each group member submitting an innovation one-pager, your group will need to create some kind of collective artifact or presentation that presents your vision for the Future School.

Convention Format

- Presentations - 20-30 minutes
    - Each group will get between 2 and 4 minutes to present their vision for the Future School
- Gallery Walk - 10-15 minutes
    - Groups will leave their presentation materials and Innovation 1-Pagers around the room
    - All convention attendees will circulate the room reviewing 1-Pagers that feel particularly interesting to your character
- Voting / Feedback - 5 minutes
    - Each attendee will vote for the Group Vision and individual innovation they believe is best
    - Attendees may not vote for themselves or their group members

Presentation Format: Your presentation can be in almost any format you want. You could make a poster or slides, but you're also welcome to perform a skit, record a video, make a commercial, write a poem / song, or any other format that you think will be effective for communicating your vision. Aim for a presentation that is

- **Coherent:** Explains the theme that ties your different innovations together
- **Compelling:** Highlight the benefits of your vision and get the audience excited
- **Creative:** Choose the format that will best communicate your vision
- **Clear:** Make it clear specifically what you're proposing
- **Collaborative:** Every group member has a role, and every innovation is briefly explained
- **Concise:** You'll only have a couple minutes

Presentation Vision: What is the unifying theme of your group? What is the shared vision?

_____

_____

_____

Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

_____

_____

_____

Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

Step 7 - Evaluate

Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

Best Overall Vision: _____

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Project Guide - Analyzing Innovations	Clear evidence of having fully considered three potential innovations.	Evidence of having considered two innovations or incompletely considering three.	Evidence of only having considered one potential innovation.	No record of evidence of having considered multiple innovations.
Project Guide - Benefits and Harms	Steps 1 and 3 indicates thorough consideration of multiple innovations from the perspective of the character.	Steps 1 and 3 are occasionally incomplete or include a small number of comments disconnected from the character profile.	Steps 1 and 3 are incomplete or often disconnected from the character profile assigned.	No response in steps 1 and 3
One Pager - Purpose and Benefits	Response clearly indicates the purpose of the innovation and the specific groups that would benefit from it.	The response occasionally lacks clarity on the purpose of the innovation or does not specifically indicate a group that would benefit.	The response does not clearly indicate the purpose of the innovation or the specific groups that would benefit.	No response is given
One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
One Pager - Concerns	The response clearly explains one or more valid privacy or security concerns as well as the specific groups that would be harmed.	The response includes some incomplete or inaccurate information about the concern or the specific groups harmed.	The response includes significant factual inaccuracies about the privacy / security concern or does not indicate a specific group that is harmed.	No response is given
One Pager - Addressing Concerns	Response indicates understanding of an actual cybersecurity technique that directly addresses the concerns listed.	Response indicates understanding of a cybersecurity technique but it may not directly address the concerns lists.	Response either includes incorrect information or does not directly address the concerns listed.	No response is given
One Pager - Sources	Multiple sources of information are completely cited	Multiple sources are cited though in some cases incompletely	Sources are incompletely cited or one source is used.	No sources are cited
Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
Group Presentation - Clear and Compelling	The presentation and overall vision was both clear, briefly explaining each innovation, and compelling, highlighting the benefits of the overall vision.	The presentation was compelling but occasionally lacked clarity on what specifically was being proposed.	The presentation may not have been compelling or clear.	The presentation did little to highlight the benefits of the overall vision or clearly explain what was being proposed.

Ryanne

High School Physical Education

Background: As a high school physical education teacher you want to make sure students are fit, healthy, and develop good habits for staying that way during and after high school. You're interested in introducing students to new sports and activities they can carry with them beyond high school, helping to teach them good nutritional habits, and helping students see the connections between physical health and mental wellbeing. You want to help develop a vision for a school where technology helps students stay fit and develop good habits to last a lifetime.

Goals in the Simulation

- Ensure your innovation promotes students' physical health and well-being
- Help shape your teammates' proposals to ensure they're promoting a healthy and active lifestyle

Research Innovations in the Following Fields

- Fitness
- Nutrition
- Sports
- Health and wellbeing

Marcus

High School Art

Background: As a high school art teacher you believe that artistic expression is an important outlet for your students both now as teenagers and into their adult life. Historically you have taught students to paint and draw, but you are extremely excited by the creative possibilities offered by new technologies. With funding for art programs shrinking in recent years, you're excited by the possibility of this conference to encourage re-investment in the arts and finding ways to integrate artistic expression into both what students learn and how the school building looks and feels.

Goals in the Simulation

- Ensure your innovation promotes students developing artistic expression.
- Help shape your teammates' proposals also promote a vision of a school where artistic expression is valued

Research Innovations in the Following Fields

- Interactive art
- Digital art

Amelia

High School Science

Background: As a high school science teacher you're interested in seeing students develop their understanding of all science topics. You know that an understanding of science topics helps your students better understand their world and also prepares them for exciting new careers. Computing and vast amounts of data have rapidly changed the way that scientists develop medicines, explore space, or simply study human behavior. You'd like to find ways to bring this exciting new direction for science into the classrooms of the school of the future!

Goals in the Simulation

- Ensure your innovation promotes students in developing deep understandings of science, especially in this new computational age
- Help shape your teammates' proposals also promote a vision of a school where science is used to help students understand the world as it is as well as the way the world may change in the future.

Research Innovations in the Following Fields

- Science
- Medicine
- Science education

Raj

High School Drama

Background: As a High School Drama teacher, you deeply care about each of your students - particularly when it comes to finding their voice. You encourage students to be brave and try new things. Nothing brings you more joy than when a self-described shy student comes alive on stage. Your school participates in small drama competitions where you have to bring your technology with you. This has been a challenge in the past, as your microphones are old and disrupt the quality of the performance. In general you're excited to think about how technology innovations could improve the opportunities students have to express themselves.

Goals in the Simulation

- Ensure your innovation helps enhance drama productions that will benefit all in your school - actors, behind the scenes tech crew, and the audience.
- Help your teammates shape proposals that focus on encouraging students to be heard.

Research Innovations in the Following Fields

- Lighting
- Sound (microphones, speakers)

Bea

Age 17

Background: As a high school junior you're extremely excited to speak up for student needs. One of your top concerns, however, is the fact that you don't own a smartphone or have the ability to access the Internet at home. With many modern systems and innovations wrongly assuming all students have equal technology access, you're looking to make sure the vision for the school that you and your partners present doesn't rely on technology or access that all students do have. In fact, your hope is you can help drive your team to develop innovations that broaden access to technology.

Goals in the Simulation

- Ensure your innovation supports students who do not have technology access at home
- Help shape your teammates' proposals support students who do not have technology access at home

Research Innovations in the Following Fields

- Internet access
- Technologies to close the Digital Divide

Donyel

Age 16

Background: As a high school sophomore attending an online school, technology is already a big part of your school experience. You attend classes online by watching recorded lectures, using video-conferencing for some classes, and completing many of your activities remotely. Online schools have given you access to a wide variety of teachers and classes, but the experience can sometimes feel alienating. At the conference you're looking for ways to further improve remote learning opportunities for you and other students.

Goals in the Simulation

- Ensure your innovation supports students who are learning at a distance
- Help shape your teammates' proposals to make sure they support the needs of students learning at a distance.

Research Innovations in the Following Fields

- Remote learning
- Online schools
- Distance learning

Petra

Age 17

Background: As a high school junior you're extremely excited to represent the needs of students. In sophomore year of high school two of your closest friends moved away, and so a significant challenge you've been facing in high school is loneliness. While many of your classmates use many different social media apps, you don't really feel like any of those are supporting you in developing new friendships. You're hopeful that your team can present a vision that doesn't just focus on the academic side of high school, but improves the way people interact and socialize to help other students like you.

Goals in the Simulation

- Ensure your innovation promotes students' in positive social interaction
- Help shape your teammates' proposals to ensure they're promoting a social and positive environment.

Research Innovations in the Following Fields

- Social media
- Community

Rosetta

Age 18

Background: As a high school senior, you are looking forward to graduating from high school and making a difference in the world. You love to be active - you spend a lot of time outside hiking during the summer and leading younger students in adventures in nature. Your favorite class in school is biology because you get to learn more about the environment and different ecosystems and are president of the school's "Green and Clean" club which advocates for taking care of the planet and other environmental issues. You like how technology can cut down on using paper in the school, but you would be out in nature and learning about the world than on a computer reading about it.

Goals in the Simulation

- Ensure your innovation helps the school be a better steward of natural resources and energy.
- Encourage your team to consider the environmental impact on any proposal they make.

Research Innovations in the Following Fields

- Green schools
- Outdoor education

Nina

Facilities Manager

Background: As a Facilities Manager you're responsible your responsibilities are far-reaching, from making sure the lights go on, the trash goes out, the plumbing works, the building is kept up to code, and the grounds are clean and maintained. As a result, when you think about building a school of the future, you're thinking literally about the building! You're looking for ways to make modern school buildings that can detect and possibly solve problems for you, and help save on costs for running facilities.

Goals in the Simulation

- Ensure your innovation helps make the school building a smarter and easier-to-maintain facility
- Help shape your teammates' proposals to ensure they're helping create a smarter and easier-to-maintain facility

Research Innovations in the Following Fields

- Smart buildings

Lionel

Bus Driver

Background: As a bus driver you think a lot about the logistics of getting students to school every day. Coming up with a bus route that is close to all students has proven challenging which means that many students are far away from any of the stops on your routes. With traffic being unpredictable, you're often dropping students off late. The result is an inefficient system that encourages students to use other means of transportation. You're coming to the conference with visions of how technology could help make transportation to school more responsive, personalized, and efficient.

Goals in the Simulation

- Ensure your innovation helps simplify or automate the way students and staff get to and from the school
- Help shape your teammates' proposals to ensure they promote your vision of a smarter transportation system

Research Innovations in the Following Fields

- Transportation
- Accessibility

Mandy

Cafeteria Prep Cook

Background: As a Cafeteria Prep Cook you're interested in improving the way that students eat while at school. Providing delicious and nutritious meals has always been the goal, but it's hard work doing that day after day for lots of hungry students. You're concerned that meals aren't always nutritionally balanced, students are looking for greater variety in their meals, and many students with food allergies and restrictions don't know if they can eat the meals provided at school. Managing all the inventory of food is itself a huge task, and you're certain that parts of the work to cook and prepare the meals could be automated. In general you're looking to develop a vision of a school that provides a smarter and more delicious eating experience for students.

Goals in the Simulation

- Ensure your innovation helps simplify, automate, or improve students dining experience
- Help shape your teammates' proposals to ensure they promote a vision in which students eat healthy and have more information about what they eat

Research Innovations in the Following Fields

- Cooking
- Nutrition
- Food

Donna

Security Officer

Background: As a Security Officer your primary role is making sure that students and staff are safe at school. Many high schools have been adding increased security measures to monitor and protect their campuses and you're interested in investigating the ways technology can help. While you're worried about students making trouble, you're even more concerned about the influence and dangers of outside intruders. Your goal is to make the campus a safe place for all to live and learn.

Goals in the Simulation

- Ensure your innovation helps improve student and staff's security
- Help shape your teammates' proposals to ensure they promote a vision in which schools are secure places

Research Innovations in the Following Fields

- Security
- Safety
- Campus security

Pedro

High School Principal

Background: As a high school principal you have many concerns but a primary one is making sure your students are ready for life after high school. Whether they head to college, the workforce, or something else, you want to make sure that students understand their options and are set up to make good ones. When you talk to students, many don't really seem to understand the opportunities that await them once they graduate. You're curious if there's ways that technology could be used to connect students with local businesses, help them better understand colleges, and identify the next step they want to take in life.

Goals in the Simulation:

- Ensure your innovation helps students prepare for life after high school
- Shape your team's innovations to make sure they also prepare students for life after high school

Research Innovations in the Following Fields:

- Career advising
- Work study
- College search

Flora

High School Vice Principal

Background: As a high school vice-principal you have a sometimes thankless job at your school: being the disciplinarian. You regularly meet with students who are late to class, skipping school, disrupting the cafeteria, etc. Your goal is not to solely punish students, but to get to know them and understand why these behaviors are happening, and see what you can do to help. After school, you can be found out on the field coaching field hockey. Your team is scrappy - not the best in your league, but your athletes work hard and you are proud of them. You don't have a lot of free time, so you are interested in how technology can help you better connect with students - both in the building and on the field. You are worried about technology that could lead to more students ending up in your office for disciplinary reasons.

Goals in the Simulation:

- Ensure your innovation helps students who are sometimes categorized as troublemakers.
- Beware of innovations that could lead to student distraction or misbehavior.

Research Innovations in the Following Fields:

- Athletics
- School organization
- Communications

Cam

School Board Superintendent

Background: As a school board superintendent you are in charge of an entire school district. You've always believed that schools are a part of a broader community and that well functioning schools have students, teachers, and staff that are connected to the needs of that community. Whether it's opportunities for service work, having students connect with local businesses, or simply sharing and celebrating what students are learning in school, you are constantly pushing the schools you oversee to find deeper ties between themselves and their community. As you attend the conference you are looking to propose ideas that can help build those ties.

Goals in the Simulation

- Ensure your innovation helps develop stronger ties between schools and their community
- Help shape your teammates' proposals to build stronger ties between schools and their community

Research Innovations in the Following Fields

- Service work
- Community building

Carla

High School Academic Dean

Background: As an academic dean your job is to ensure students are learning and making good progress towards graduation. With hundreds of students to support, however, it's difficult to know when some students begin to struggle, how to make sure each student's on track, or even simple things like whether they're on track to graduate. If you had technologies that could help you, students, and their families better track this information or notice when there are issues you think you'd be able to provide better support.

Goals in the Simulation

- Ensure your innovation helps your students stay on track academically
- Beware of innovations that may make it more difficult to effectively track student academics

Research Innovations in the Following Fields

- Grade tracking
- Academic tracking
- Advising

Jova

Parent of a 9th Grader

Background: You are the parent of a 9th grade student and in a sense it's funny that you're attending this conference. You've always been skeptical about technology in general and are particularly worried about just how much time your children spend looking at screens. You've reluctantly purchased a smartphone for your 9th grader, but worry that this technology is actually creating deeper social isolation. As you join your team you're open to the role technology can play but are focused on ensuring it's a vision that is more social and encourages more face-to-face, rather than face-to-screen, interaction.

Goals in the Simulation

- Ensure your innovation helps minimize screen time and increases face to face interaction
- Beware of innovations that increase screen time or decrease face to face interaction

Research Innovations in the Following Fields

- Screen time
- Digital health
- Community

Ben

Parent of a 10th Grader

Background: You are the parent of a 10th grader. While your child was born in the United States, you were born abroad and feel a great deal of pride both of your native culture and your new home in the United States. You believe there are benefits to all children in better understanding the diversity of international cultures and want a multicultural perspective to be part of the vision of a school of the future. With technology making it easier for students around the globe to share and communicate with one another, you're hoping to find and propose technologies that bring a more international and multi-cultural perspective to the innovations your team presents.

Goals in the Simulation

- Ensure your innovation helps your students develop a more multicultural perspective
- Ensure your partner's innovations help promote this same vision

Research Innovations in the Following Fields

- Cultural exchange
- International education

Desiray

Parent of an 11th Grader

Background: You've seen a lot of changes in your daughter, as she's transitioned from a young high schooler to a young adult. Now she's in 11th grade, and you could not be more proud of her accomplishments. You are excited about the future, and want to make sure she is ready for whatever comes her way. You've tried to expose your daughter to as much technology as possible, but you only have one computer at home. Your hopeful that the local school will be able to fill in the gaps so she is able to easily interact with technology. You are excited to be at this conference, because you are interested in being able to better track your daughter's progress in school and also suggest innovations that will be beneficial for students like your daughter to be exposed to before leaving school.

Goals in the Simulation

- Look for innovations that are beneficial for students to know how to interact with before leaving school
- Consider innovations that will help parents track student progress

Research Innovations in the Following Fields

- Education
- Educational Technology

Greta

Parent of a 12th Grader

Background: As a parent of a student that is about to graduate, you want the school of the future to prepare students for a job right after high school. You don't think college is for everyone and want your child to be able to find a good job right after school. You think most schools are too focused on sending students to expensive colleges that are far away, you would like your student to get a job in the local community after high school but are concerned that after 13 years of school, your student doesn't actually have any skills that will help him get a good job.

Goals in the Simulation

- Ensure your innovation helps students get technical skills needed in careers in your local community.
- Help shape your teammates' proposals to be focused on getting a job after high school.

Research Innovations in the Following Fields

- Vocational education
- Maker spaces

Unit 10 Lesson 2

Project - Innovation Simulation Part 2

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

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1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

Lesson	Key Beats of the Lesson	Connection to the Project Guide	Other notes
U10L1: Project - Innovation Simulation Part 1	1. The teacher introduces the simulation and hands out “roles” to students. 2. Students explore what a computing innovation is and watch a video. 3. Students brainstorm innovations that might be useful to Future School. 4. Students reflect on their character’s role and what innovations their character might be most interested in.	Students finish Step 1 - Reflect of the Project Guide. The teacher models how to do Step 2 - Research of the Project Guide.	Students don’t do their own research on this day. That comes in the next lesson.
U10L2: Project - Innovation Simulation Part 2	1. The teacher hands out badges and nameplates from the previous lesson to get students into “simulation mode” 2. Students research three different computing innovations and discuss these innovations with team	Students finish Step 2 - Research of the Project Guide.	None.

	members.		
U10L3: Data Policies and Privacy *(Students do not work on the project during this lesson)*			
U10L4: The Value of Privacy *(Students do not work on the project during this lesson)*			
U10L5: Project - Innovation Simulation Part 3	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. The class watches a video about unintended consequences of computing innovations. 3. Students meet with their groups to discuss pros and cons of the different proposed innovations they researched in Step 2. 4. Students document the feedback they gave in Step 3 of the Activity Guide. 5. Students select one innovation which will ultimately become part of their groups’ vision for the Future School. 6. Students start to work on their One-pagers.	Students finish Step 3 - Feedback of the Project Guide. Students start Step 4 during this lesson. This step will be finished in U10L8.	This builds on previous lessons where students have considered ways that computing innovations may risk their privacy and have other unintended consequences. In future parts of this project, students will present their “vision” for the school of the future which includes each of these innovations that their team selects. Together, all of the innovations should help form a complete vision of what their team is proposing.
U10L6: Security Risks Part 1 *(Students do not work on the project during this lesson)*			
U10L7: Security Risks Part 2 *(Students do not work on the project during this lesson)*			
U10L8: Project - Innovation Simulation Part 4	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 4 in their Project Guide.	Students work on Step 4 - One-pager of the Project Guide. They should have most of it finished by the end of the lesson with the exception of the “Addressing Concerns” section which will be addressed later.	Students may leverage what they learned in U10L6 and U10L7 about security risks to identify “concerns” about their innovation in Step 4 of their Project Guide.
U10L9: Protecting Data Part 1 *(Students do not work on the project during this lesson)*			

U10L10: Protecting Data Part 2 *(Students do not work on the project during this lesson)*			
U10L11: Project - Innovation Simulation Part 5	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 5 in the Project Guide and put together a presentation focused on a theme for their vision for the Future School.	Students should mostly have Step 5 of the Project Guide done by the end of this lesson. They will get feedback on their presentation from Step 5 in the next lesson.	Students may leverage what they learned in U10L9 and U10L10 to finish the “Addressing Concerns” section of Step 4 of their Project Guide.
U10L12: Project - Innovation Simulation Part 6	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students break their group into smaller groups and present their ideas to a different small group. 3. Students give and get feedback from a different small group. 4. Students come back to their original groups and use the feedback they received to make changes to their presentations and one-pagers.	This is an opportunity for students to finish and revise any portions of Step 4 - One-pager and Step 5 - Preparing your Group Presentation in the Project Guide.	
U10L13: Project - Innovation Simulation Part 7	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students do short presentations of their proposals. 3. Students do a gallery walk to look at the proposals and the one-pagers other groups developed. 4. Students finish Step 7 in the Project Guide by voting for one “Overall Vision” and one “Innovation” that they felt was most compelling.	Students finish Step 6 and Step 7 of the Project Guide during this lesson.	Students should vote as their character. For example, if they were assigned a specific “Parent” role, they should vote as that parent. This is the last day of the simulation. Students will turn in their work at the end of the hour and turn in their name badges for the last time!
U10L14: Assessment Day *(Students do not work on the project during this lesson)*			

Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

Project Description

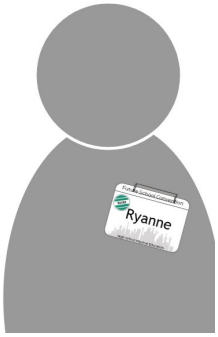
Welcome to the Future School Convention! You have been chosen to attend this convention because you represent an important stakeholder in the broader school community. Together with a small group you will brainstorm and research computing innovations that you believe will have a positive impact on schools. At the end of the convention, your team will pitch your best idea to a panel of judges.

Deliverables

- Individual:
  - This completed project guide
  - A computing innovation proposal
- Group:
  - An artifact displaying your team members' innovations
  - A presentation of the team's top innovation

Simulation

This project is a simulation where you and your classmates role play as delegates at a convention. There are times throughout this unit when you will be in simulation mode. Look for the red "Innovation Simulation" header at the top of slides as an indication of when the simulation is live. You should also wear your nametag and display your nameplate.



Step 1 - Reflection

My Character's Name	
My Role	
Consider what your character would want or need in a computing innovation for the Future School. Explain why.	

Step 2 - Research

Choose three different computing innovations you would like to recommend for the Future School. These can be innovations that were brainstormed as a team, or new ones that you think of. Check with your team to make sure no one is researching the same innovations.

Computing Innovation #1	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #2	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #3	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Step 3 - Feedback

In the space below record three pieces of feedback you gave to teammates about their proposed innovations and why you provided that feedback.

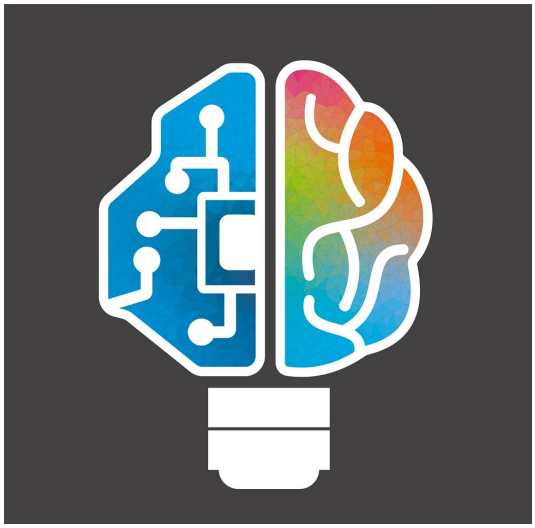
Innovation / Teammate	Feedback	Why You Gave It

Step 4 - One Pager

Based on the feedback you received, complete the one-pager on the next page for the innovation that best responds to your team's feedback and aligns with a unifying group theme or vision for the Future School.

Innovation One-Pager

<Name of the Innovation>



Replace the text above with the name of your innovation
Replace the image to the right with an image of your innovation

Purpose and Benefits
Write a paragraph or bullets explaining the reason the innovation exists. You should include:

- *The specific groups in the school community you believe would benefit*
- *The specific problems or challenge that group is facing*
- *The specific ways that group would benefit*
- *At least one specific reason your character would be interested in this innovation.*

Function
Write a paragraph or bullets explaining how the innovation actually works. You should include:

- *A high level description of how users interact with the innovation*
- *What data the innovation uses or collects*
- *How that data is processed and stored*

Concerns
Write a paragraph or bullets explaining potential concerns or risks posed by this innovation. You should include

- *At least one specific group that could potentially be harmed by the innovation and the way they could be harmed*
- *At least one specific privacy or security concern that arises from collecting the data needed to run your innovation.*

Addressing Concerns
Write a paragraph or bullets explaining the ways you could address potential concerns about your innovation. You should include:

- *Direct ties to the concerns raised in the previous paragraph*
- *At least one cybersecurity technique that could be used to make the innovation more secure*
- *Ways you would be willing to limit the innovation or alter its functionality to avoid the concerns*

Sources
List all sources that you used in making this project using the format below. Make sure to cite the source of your image.

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

Step 5 - Preparing Your Group Presentation

In addition to each group member submitting an innovation one-pager, your group will need to create some kind of collective artifact or presentation that presents your vision for the Future School.

Convention Format

- Presentations - 20-30 minutes
    - Each group will get between 2 and 4 minutes to present their vision for the Future School
- Gallery Walk - 10-15 minutes
    - Groups will leave their presentation materials and Innovation 1-Pagers around the room
    - All convention attendees will circulate the room reviewing 1-Pagers that feel particularly interesting to your character
- Voting / Feedback - 5 minutes
    - Each attendee will vote for the Group Vision and individual innovation they believe is best
    - Attendees may not vote for themselves or their group members

Presentation Format: Your presentation can be in almost any format you want. You could make a poster or slides, but you're also welcome to perform a skit, record a video, make a commercial, write a poem / song, or any other format that you think will be effective for communicating your vision. Aim for a presentation that is

- **Coherent:** Explains the theme that ties your different innovations together
- **Compelling:** Highlight the benefits of your vision and get the audience excited
- **Creative:** Choose the format that will best communicate your vision
- **Clear:** Make it clear specifically what you're proposing
- **Collaborative:** Every group member has a role, and every innovation is briefly explained
- **Concise:** You'll only have a couple minutes

Presentation Vision: What is the unifying theme of your group? What is the shared vision?

_____

_____

_____

Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

_____

_____

_____

Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

Step 7 - Evaluate

Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

Best Overall Vision: _____

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Project Guide - Analyzing Innovations	Clear evidence of having fully considered three potential innovations.	Evidence of having considered two innovations or incompletely considering three.	Evidence of only having considered one potential innovation.	No record of evidence of having considered multiple innovations.
Project Guide - Benefits and Harms	Steps 1 and 3 indicates thorough consideration of multiple innovations from the perspective of the character.	Steps 1 and 3 are occasionally incomplete or include a small number of comments disconnected from the character profile.	Steps 1 and 3 are incomplete or often disconnected from the character profile assigned.	No response in steps 1 and 3
One Pager - Purpose and Benefits	Response clearly indicates the purpose of the innovation and the specific groups that would benefit from it.	The response occasionally lacks clarity on the purpose of the innovation or does not specifically indicate a group that would benefit.	The response does not clearly indicate the purpose of the innovation or the specific groups that would benefit.	No response is given
One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
One Pager - Concerns	The response clearly explains one or more valid privacy or security concerns as well as the specific groups that would be harmed.	The response includes some incomplete or inaccurate information about the concern or the specific groups harmed.	The response includes significant factual inaccuracies about the privacy / security concern or does not indicate a specific group that is harmed.	No response is given
One Pager - Addressing Concerns	Response indicates understanding of an actual cybersecurity technique that directly addresses the concerns listed.	Response indicates understanding of a cybersecurity technique but it may not directly address the concerns lists.	Response either includes incorrect information or does not directly address the concerns listed.	No response is given
One Pager - Sources	Multiple sources of information are completely cited	Multiple sources are cited though in some cases incompletely	Sources are incompletely cited or one source is used.	No sources are cited
Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
Group Presentation - Clear and Compelling	The presentation and overall vision was both clear, briefly explaining each innovation, and compelling, highlighting the benefits of the overall vision.	The presentation was compelling but occasionally lacked clarity on what specifically was being proposed.	The presentation may not have been compelling or clear.	The presentation did little to highlight the benefits of the overall vision or clearly explain what was being proposed.

Unit 10 Lesson 3

Data Policies and Privacy

Resources

Name(s)_____ Period _____ Date _____

Activity Guide - Privacy, Security, and Innovation

Choose a Website and Find the Data Privacy Policy

Choose an app, website, or other online service you are familiar with to research their data policy. The easiest way to find a data policy, if it exists, is to search for the company name followed by the terms “data policy” or “privacy policy.”

Your website or app: _____

What Is Their Data Policy?

Respond to the questions below. Even if you can’t find information, you should record where you looked and the fact that you can’t find it. If there isn’t a policy or it’s hard to find, that can be just as interesting as seeing the policy itself.

Question 1: What kinds of data is collected?

Question 2: How is the data you listed above being used? What features are enabled by the data?

Question 3: Does the company share the data with anyone else? Who?

Question 4: Can you get access to your own data? Can you modify what is collected, or delete your data if you wish?

Privacy vs. Security Tradeoffs

Question 5: Do you believe the benefits of the innovation you researched outweigh the privacy concerns? Explain why or why not making explicit connections to responses 1-4 above.

Question 6

- **1 - Totally Comfortable** "Have my data! It makes the technology I love work and keeps me safe!"
- **2 - Mostly Comfortable** "I want tech innovations and stronger security. Let's make sure we take care of the most damaging privacy concerns."
- **3 - Mixed** "There's a lot of this that makes me uncomfortable, but I'm still going to use technology."
- **4 - Mostly Uncomfortable** "Privacy is more important than empowering innovations or ensuring security. I would give up on some tech innovations to ensure my privacy"
- **5 - Totally Uncomfortable** "I'd give up most technology and would like to see much stronger limits on what kind of data can be collected and stored, even if it limits the introduction of new technology"

Which of the above categories best describes your overall comfort with using data to drive innovations or ensure security? Write a paragraph below explaining your response and tying it to either the information in this activity guide or discussions shared in class.

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Data Collection and Use	Response 1 include many examples of data collected by the company that are clearly tied to the examples in Response 2 indicating how that data is used.	Both responses include many examples but there may not always be connections between the kinds of data collected and the way it is used.	One or both responses is either missing significant information or there is no clear connection between the responses.	Both responses are either incomplete or missing.
Data Sharing and Control	Response 3 and 4 clearly describe how users data is shared externally and whether and if users have any controls over their data. There are clear ties between the way data is used and the controls users have over that use.	Response 3 and 4 include examples of how data is shared and controlled but there many not always be clear ties between the responses 1-3 and the data controls mentioned in response 4.	One of response 3 and 4 is significantly lacking in clarity over how the data is shared or how the data is controlled.	Both responses are either incomplete or missing.
Evaluating Your Innovation	The response provides a clear opinion on the tradeoffs based on the information provided on the first page.	The response states a clear opinion but some portions may not be tied to responses 1-4.	The response states an opinion but it is not at all tied to the responses 1 - 4.	The response is missing or unrelated to the prompt.
Evaluating the Privacy Tradeoffs Overall	The response provides a clear opinion on the overall privacy tradeoffs based on the information in this activity guide and covered in class.	The response states a clear opinion but some portions may not be tied to responses 1-4 or information covered in class.	The response states an opinion but it is not at all tied to the responses 1 - 4 or other information covered in class.	The response is missing or unrelated to the prompt.

Unit 10 Lesson 4

The Value of Privacy

Resources

Name(s)_____ Period _____ Date _____

Activity Guide - Privacy, Security, and Innovation

Choose a Website and Find the Data Privacy Policy

Choose an app, website, or other online service you are familiar with to research their data policy. The easiest way to find a data policy, if it exists, is to search for the company name followed by the terms “data policy” or “privacy policy.”

Your website or app: _____

What Is Their Data Policy?

Respond to the questions below. Even if you can’t find information, you should record where you looked and the fact that you can’t find it. If there isn’t a policy or it’s hard to find, that can be just as interesting as seeing the policy itself.

Question 1: What kinds of data is collected?

Question 2: How is the data you listed above being used? What features are enabled by the data?

Question 3: Does the company share the data with anyone else? Who?

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Privacy vs. Security Tradeoffs

Question 5: Do you believe the benefits of the innovation you researched outweigh the privacy concerns? Explain why or why not making explicit connections to responses 1-4 above.

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Evaluating the Privacy Tradeoffs Overall	The response provides a clear opinion on the overall privacy tradeoffs based on the information in this activity guide and covered in class.	The response states a clear opinion but some portions may not be tied to responses 1-4 or information covered in class.	The response states an opinion but it is not at all tied to the responses 1 - 4 or other information covered in class.	The response is missing or unrelated to the prompt.

Unit 10 Lesson 5

Project - Innovation Simulation Part 3

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

Unit 10 contains an extended project that composes 7 of the 14 lessons in this unit. It serves a number of important goals:

1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

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U10L2: Project - Innovation Simulation Part 2	1. The teacher hands out badges and nameplates from the previous lesson to get students into “simulation mode” 2. Students research three different computing innovations and discuss these innovations with team	Students finish Step 2 - Research of the Project Guide.	None.

	members.		
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U10L14: Assessment Day *(Students do not work on the project during this lesson)*			

Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

Project Description

Welcome to the Future School Convention! You have been chosen to attend this convention because you represent an important stakeholder in the broader school community. Together with a small group you will brainstorm and research computing innovations that you believe will have a positive impact on schools. At the end of the convention, your team will pitch your best idea to a panel of judges.

Deliverables

- Individual:
  - This completed project guide
  - A computing innovation proposal
- Group:
  - An artifact displaying your team members' innovations
  - A presentation of the team's top innovation

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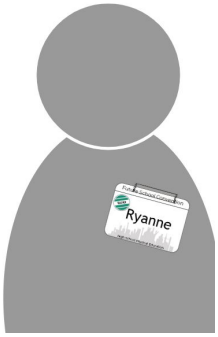


Step 1 - Reflection

My Character's Name	
My Role	
Consider what your character would want or need in a computing innovation for the Future School. Explain why.	

Step 2 - Research

Choose three different computing innovations you would like to recommend for the Future School. These can be innovations that were brainstormed as a team, or new ones that you think of. Check with your team to make sure no one is researching the same innovations.

Computing Innovation #1	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #2	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #3	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Step 3 - Feedback

In the space below record three pieces of feedback you gave to teammates about their proposed innovations and why you provided that feedback.

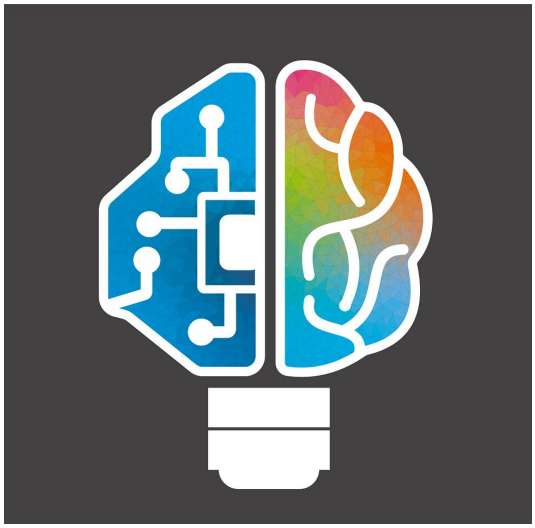
Innovation / Teammate	Feedback	Why You Gave It

Step 4 - One Pager

Based on the feedback you received, complete the one-pager on the next page for the innovation that best responds to your team's feedback and aligns with a unifying group theme or vision for the Future School.

Innovation One-Pager

<Name of the Innovation>



Replace the text above with the name of your innovation
Replace the image to the right with an image of your innovation

Purpose and Benefits
Write a paragraph or bullets explaining the reason the innovation exists. You should include:

- *The specific groups in the school community you believe would benefit*
- *The specific problems or challenge that group is facing*
- *The specific ways that group would benefit*
- *At least one specific reason your character would be interested in this innovation.*

Function
Write a paragraph or bullets explaining how the innovation actually works. You should include:

- *A high level description of how users interact with the innovation*
- *What data the innovation uses or collects*
- *How that data is processed and stored*

Concerns
Write a paragraph or bullets explaining potential concerns or risks posed by this innovation. You should include

- *At least one specific group that could potentially be harmed by the innovation and the way they could be harmed*
- *At least one specific privacy or security concern that arises from collecting the data needed to run your innovation.*

Addressing Concerns
Write a paragraph or bullets explaining the ways you could address potential concerns about your innovation. You should include:

- *Direct ties to the concerns raised in the previous paragraph*
- *At least one cybersecurity technique that could be used to make the innovation more secure*
- *Ways you would be willing to limit the innovation or alter its functionality to avoid the concerns*

Sources
List all sources that you used in making this project using the format below. Make sure to cite the source of your image.

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

Step 5 - Preparing Your Group Presentation

In addition to each group member submitting an innovation one-pager, your group will need to create some kind of collective artifact or presentation that presents your vision for the Future School.

Convention Format

- Presentations - 20-30 minutes
    - Each group will get between 2 and 4 minutes to present their vision for the Future School
- Gallery Walk - 10-15 minutes
    - Groups will leave their presentation materials and Innovation 1-Pagers around the room
    - All convention attendees will circulate the room reviewing 1-Pagers that feel particularly interesting to your character
- Voting / Feedback - 5 minutes
    - Each attendee will vote for the Group Vision and individual innovation they believe is best
    - Attendees may not vote for themselves or their group members

Presentation Format: Your presentation can be in almost any format you want. You could make a poster or slides, but you're also welcome to perform a skit, record a video, make a commercial, write a poem / song, or any other format that you think will be effective for communicating your vision. Aim for a presentation that is

- **Coherent:** Explains the theme that ties your different innovations together
- **Compelling:** Highlight the benefits of your vision and get the audience excited
- **Creative:** Choose the format that will best communicate your vision
- **Clear:** Make it clear specifically what you're proposing
- **Collaborative:** Every group member has a role, and every innovation is briefly explained
- **Concise:** You'll only have a couple minutes

Presentation Vision: What is the unifying theme of your group? What is the shared vision?

_____

_____

_____

Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

_____

_____

_____

Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

Step 7 - Evaluate

Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

Best Overall Vision: _____

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Project Guide - Analyzing Innovations	Clear evidence of having fully considered three potential innovations.	Evidence of having considered two innovations or incompletely considering three.	Evidence of only having considered one potential innovation.	No record of evidence of having considered multiple innovations.
Project Guide - Benefits and Harms	Steps 1 and 3 indicates thorough consideration of multiple innovations from the perspective of the character.	Steps 1 and 3 are occasionally incomplete or include a small number of comments disconnected from the character profile.	Steps 1 and 3 are incomplete or often disconnected from the character profile assigned.	No response in steps 1 and 3
One Pager - Purpose and Benefits	Response clearly indicates the purpose of the innovation and the specific groups that would benefit from it.	The response occasionally lacks clarity on the purpose of the innovation or does not specifically indicate a group that would benefit.	The response does not clearly indicate the purpose of the innovation or the specific groups that would benefit.	No response is given
One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
One Pager - Concerns	The response clearly explains one or more valid privacy or security concerns as well as the specific groups that would be harmed.	The response includes some incomplete or inaccurate information about the concern or the specific groups harmed.	The response includes significant factual inaccuracies about the privacy / security concern or does not indicate a specific group that is harmed.	No response is given
One Pager - Addressing Concerns	Response indicates understanding of an actual cybersecurity technique that directly addresses the concerns listed.	Response indicates understanding of a cybersecurity technique but it may not directly address the concerns lists.	Response either includes incorrect information or does not directly address the concerns listed.	No response is given
One Pager - Sources	Multiple sources of information are completely cited	Multiple sources are cited though in some cases incompletely	Sources are incompletely cited or one source is used.	No sources are cited
Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
Group Presentation - Clear and Compelling	The presentation and overall vision was both clear, briefly explaining each innovation, and compelling, highlighting the benefits of the overall vision.	The presentation was compelling but occasionally lacked clarity on what specifically was being proposed.	The presentation may not have been compelling or clear.	The presentation did little to highlight the benefits of the overall vision or clearly explain what was being proposed.

Unit 10 Lesson 6

Security Risks Part 1

Resources

Unit 10 Lesson 7

Security Risks Part 2

Resources

Name(s)_____ Period _____ Date _____

Activity Guide - Podcast Transcripts

Planet Money: Bad Credit Bureau

Episode 798, October 6, 2017
Edited transcript

ROBERT SMITH, HOST:It was a big week for apologies, and they all happened to come from one person - Richard Smith.

RICHARD SMITH: I'm truly and deeply sorry for what happened. I deeply apologize. Mistakes were made which, again, I deeply apologize. I apologize for that, but that is what happened.

UNIDENTIFIED MAN #1: OK, moving on.

KENNY MALONE, HOST: Richard Smith was testifying before Congress because he is the now former CEO of Equifax, which informed us last month that basically all of us have been hacked.

ROBERT SMITH: The company announced that the information for almost 150 million Americans has been compromised. And I know you've heard this sort of thing before with other hacks. But this hack is different because for starters, you did not sign up for Equifax, which is one of the three major credit bureaus. And for basically your entire life, they have been slurping up and storing your most personal information.

MALONE: Which means that Equifax and maybe now the hackers know my Social Security number and my address, and the fact that I opened a Gap credit card, and the fact that I missed a payment last month, and the fact that I only paid $300 towards my Subaru Impreza instead of the 400 that I normally pay.

ROBERT SMITH: Times are tight.

MALONE: They know everything.

ROBERT SMITH: One hundred and fifty million Americans looking over our shoulders for the rest of our lives, worried about someone filing our tax forms and taking our refunds.

MALONE: My personal nightmare is somebody walking into Home Depot, opening up a credit card with my name on it, grabbing a giant orange shopping cart and filling it with drills and circular saws and shop vacs.

ROBERT SMITH: And getting 10 percent off the whole thing. That's what really bugs me.

MALONE: It's my 10 percent.

ROBERT SMITH: My discount.

MALONE: At any rate, it's bad, which was pointed out to Richard Smith by a lot of our elected representatives.

GREG WALDEN: Talk about ham-handed responses. This is simply unacceptable.

ELIZABETH WARREN: Senior executives like you should be held personally accountable here.

UNIDENTIFIED MAN #2: So here in my last 13 seconds I'm going to speak to America. And I'm going to say for the 145 million people, file a lawsuit. Otherwise they're going to keep doing to you what they've been doing to you forever.

ROBERT SMITH: Hello, and welcome to PLANET MONEY. I'm Robert Smith.

MALONE: And I'm Kenny Malone. And this Equifax hack, it feels like a dystopian sci-fi future. We've got shadowy hackers roaming through our data in this central location that we didn't even sign up for. And it feels like such a modern-day problem.

ROBERT SMITH: And yet this whole mess goes back to one moment, a moment when two brothers in Brooklyn decided they were going to sell our private information to the world, and that we were not going to be the customers. We were going to be the product.

MALONE: This happened 150 years ago. And people were asking themselves the same questions we are asking ourselves now - who owns your information? Who has a right to see that information? And is there any limit on what someone is allowed to dig up on you?

ROBERT SMITH: It is quite the story. We'll have it after the break.

MALONE: Hey, Nora.

NORA LYONS: Hi.

MALONE: This is Robert.

LYONS: Nice to meet you.

ROBERT SMITH: Thanks.

MALONE: Show us the way to the secret documents.

ROBERT SMITH: We heard that one of the very first credit reports ever, precursor of this whole Equifax thing, was in the archives here at The New York Public Library. Nora Lyons helped us pull it out of storage showed us to the famous Rose Reading Room, beautiful room at the top of the library. And a research coordinator named Rebecca (ph) walks in and gently holds this little blue booklet out to us.

MALONE: I brought a pair of gloves. I didn't know if we would need them to touch - no.

LYONS: No, you don't wear them with this.

ROBERT SMITH: It's not the Gutenberg Bible.

MALONE: I thought it was.

REBECCA: Well, you wouldn't - you wouldn't wear gloves with the Gutenberg either.

LYONS: Because if it snags...

MALONE: Wait, really?

REBECCA: It's going to rip the paper.

MALONE: The front of this book says "Retail Mercantile Agency 1874."

ROBERT SMITH: It looks like a phonebook.

MALONE: There's a list of about 4,000 people who live in Brooklyn.

ROBERT SMITH: Back in the day.

MALONE: And then next to each name is an address and then some old-timey job - butchers, druggists.

ROBERT SMITH: So many grocers. And there was a sailor of some sort.

MALONE: What's his name? Oh, it's just Captain Collins (ph).

ROBERT SMITH: Captain Collins always pays his debts. He gets an A.

MALONE: Does it say that?

ROBERT SMITH: He does get an A.

MALONE: And sure enough next to each name is a letter, a letter grade that tells us just how trustworthy Captain Collins was. So we flip to the front of the book.

ROBERT SMITH: Oh, look; right here.

MALONE: So this is the key.

ROBERT SMITH: An A means that the captain pays his debts right away. If there had been a B there, it would mean that he always paid in cash. Letter C would mean perhaps he didn't always pay his debts on time.

MALONE: And then there's one final code, and it's an ampersand or, like, the...

ROBERT SMITH: And.

MALONE: Like an and. And it basically means we're not going to put this person's rating in this book. Come talk to us. There's some stuff you should probably know about this person.

ROBERT SMITH: We had some questions about how the book worked in real life in Brooklyn back in the day, so we went to an expert, Josh Lauer. He wrote a book.

JOSH LAUER: My book is called "Creditworthy: A History Of Consumer Surveillance And Financial Identity In America."

MALONE: You went - you went for broke on that subtitle.

LAUER: I did.

ROBERT SMITH: Josh explained to us that credit in the early 1800s, it was not what we think of today. It wasn't credit cards or auto loans because, like, obviously those did not exist back then.

MALONE: What credit meant was a tab at your town store. So let's say that Robert Smith, you are a farmer and it's 1825. What crops are you...

ROBERT SMITH: Farm apples.

MALONE: Apples, OK. So Robert goes into the grocery store to pick up whatever he needs, maybe like some butter, some cigars. And Robert tells the grocer...

ROBERT SMITH: Yeah, I don't have any money. The apple crop hasn't come in yet. And so I'm going to need you to extend me some credit.

MALONE: And I, as the grocer, I look at Robert and I say, oh, Mr. Smith. Well, I know your uncle and I've known your

father, and darn it if I don't trust the Smiths more than I trust myself.

LAUER: And he says, take your butter, take your cigars. I know you'll come back next week and you'll settle. And...

ROBERT SMITH: And good day, sir.

LAUER: And good day.

MALONE: And that system worked for a long time. But after the Civil War, people started moving around, heading to cities, especially Brooklyn, N.Y.

ROBERT SMITH: Give me a little sound effects from Brooklyn.

LAUER: How about this? Extra, extra, read all about it - population of Brooklyn booming.

MALONE: Love it.

ROBERT SMITH: Love it. This created a problem. More strangers were showing up at the grocery store looking to buy things on credit, and the grocer needed to answer a pretty simple question - will this person pay me back? I know nothing about him.

MALONE: Enter the Cells (ph) brothers.

LAUER: Herman (ph) and Conrad (ph) Cells. And there isn't a lot of evidence that survives about them and about who they are.

ROBERT SMITH: So for the purposes of this story, we can imagine them however we like. You know, handlebar mustaches, blue velvet vests.

MALONE: Maybe some monocles, maybe pocket watches.

ROBERT SMITH: A jaunty cane.

MALONE: Cane - yes, yes. The Cellses were Mr. Peanutses.

ROBERT SMITH: They were two Mr. Peanuts.

MALONE: The Cells brothers were in Brooklyn in 1869. And they start going around to the butchers and the druggists and the tailors.

LAUER: And saying, we're organizing a list of all customers in our neighborhood.

MALONE: So it would be great, dear cobbler, if you would let me look at your books and find out who's in there, who pays cash, who uses credit, who pays back that credit. And that way if a stranger named Robert Smith walks into my store, I would just pull out the Cells book.

ROBERT SMITH: Oh, yeah, look right here - Robert Smith, plumber, 1102 Lafayette Avenue, B-A. Always pay in cash, always pay on time.

MALONE: Robert Smith.

ROBERT SMITH: Smith motto.

MALONE: Is that true?

ROBERT SMITH: That's - no. No.The one thing that struck us when we looked at this little pamphlet is you could

almost feel the Cells trying to be as careful as humanly possible to give the minimum amount of information. They're not judging people. They're not slandering them. They just put down the name, the job and a simple little rating.

MALONE: It was almost as if the Cells knew that if they were going to create an industry where people's information was the product that maybe, like, just maybe you should be careful with that information.

ROBERT SMITH: So we should note it says confidential on here.

MALONE: Yeah. Which means sitting here, reading these names and these ratings, this is the equivalent of an 1874 Equifax hack.

ROBERT SMITH: (Laughter) We're hacking 18-something-something Brooklyn.

MALONE: And leaking everybody's credit rating.

ROBERT SMITH: (Laughter).

MALONE: The Cells' idea was a huge success. It was obviously good for retailers who could lend more credit and sell more stuff.

ROBERT SMITH: And it was also good for people who wanted to buy things, people like my doppelganger from the 1800s, Bob Smith the plumber. He could get credit almost anywhere because it said in a little book that he always paid his debts. And frankly, he could probably get a discount on the things he bought because he was not a risk.

MALONE: These credit reports were such a big success that over the next century, thousands of credit bureaus were established all over the country. And like any competitive marketplace, these bureaus tried to have the best product, which in this case means that there was market pressure for more and more information.

ROBERT SMITH: Yeah, the Cells brothers just gave you a letter grade. But imagine some other credit agency says, well, you know, we have a bunch of personal information about Robert Smith the plumber. Don't you want to buy our book instead?

MALONE: And so a lot of information ended up in people's credit files.

ROBERT SMITH: Marital status.

LAUER: Marital status. Married men were...

MALONE: Married men were considered less risky, needed to remain upstanding and pay their debts.

ROBERT SMITH: Do I want to know medical conditions?

LAUER: If you could know something about that...

MALONE: If you have a broken foot and can't work, that'd be good to know, might not pay back your debts. What about vices - drinking, gambling, philandering?

LAUER: Absolutely. So...

MALONE: Over time, credit bureaus realized that these dossiers, they weren't just useful for lenders. Insurance companies and employers might also like to see them. And so they kept growing and building their consumer reports.

ROBERT SMITH: Consumers sort of knew the information was being collected. But the full extent of this collection came out in 1966 because of an almost offhand comment in Washington, D.C.

MALONE: What had had happened was the Congress was holding a totally unrelated set of hearings. The Bureau of

Labor Statistics and the U.S. Census Bureau were proposing a computerized centralized database.

ROBERT SMITH: And the representatives were losing their minds. I mean, this was Big Brother. This could not stand. So they held hearings. And during one of those hearings a computer expert was testifying. And he was like, you guys are worried about collection and centralization of data? You do know that's already happening - right? - with the credit bureaus?

MALONE: And Congress was like, what? We need new hearings right now.

ROBERT SMITH: More hearings.

MALONE: Let's do it. It actually took two years. But let's do it.

ROBERT SMITH: And the news coverage of the time, it could have come from this week.

UNIDENTIFIED REPORTER: In Washington, another day of hearing on the behavior of the credit bureaus who keep records on almost everyone.

MALONE: And it is eerie to listen to these old hearings. Nothing has changed. They trot out a figurehead from one of these credit bureaus.

UNIDENTIFIED ATTORNEY: And we received him courteously. And we discussed…

ROBERT SMITH: This Jimmy Stewart-talking gentleman was an attorney for the Retail Credit Company. The Retail Credit Company was one of the largest bureaus at the time.

MALONE: And this next piece of tape has no relevance, but just listen to how he talks.

UNIDENTIFIED ATTORNEY: And I don't blame them a bit, see?

ROBERT SMITH: See?

MALONE: See?

ROBERT SMITH: See, at this hearing, what came out was this pretty damning copy of someone's credit report.

MALONE: We have a copy of this because it was filed during the hearings. It's for a woman named Mary Wilson. And she was having trouble finding a job, she learned, because of what the Retail Credit Company put in this report. It says here that Mary is, quote, "dominating."

ROBERT SMITH: Peculiar.

MALONE: And worst of all, quote, "neurotic or psychotic."

ROBERT SMITH: And it does not say who said this about her. Maybe it was her neighbor or someone she worked with. For sure we know it was not a doctor diagnosing her as psychotic. It was essentially a piece of hearsay.

MALONE: The 1960s senators were outraged at the Retail Credit Company. But instead of apologizing...

UNIDENTIFIED ATTORNEY: What's wrong with hearsay?

MALONE: The Retail Credit Company's lawyer dug in his heels.

UNIDENTIFIED ATTORNEY: Hearsay is bandied around in these hearings as though it was a dirty word, and it isn't.

ROBERT SMITH: I don't know, Congress seemed to think it was a dirty word because these hearings spawned the first

major piece of legislation to finally regulate credit bureaus. It's called the Fair Credit Reporting Act of 1970.

MALONE: That law and some of the amendments that would come later, they would effectively stop credit bureaus from collecting hearsay and rumors. They would allow consumers to see their own credit files. They would attempt to fix errors and to limit some of the reasons that people could pull your consumer report.

ROBERT SMITH: The credit reporting industry changed pretty quickly after this. Computers meant that data could be centralized and spread more easily, which meant you didn't need small regional bureaus in every town to collect gossip on people. The industry consolidated, it consolidated, it consolidated until eventually there were only three big credit reporting bureaus.

MALONE: And Josh Lauer, our credit historian, says the Retail Credit Company took such a beating during these hearings and in the years to come that it decided to change its name to something more equal-sounding, more fact-based.

ROBERT SMITH: Equal and fact-based.

MALONE: They changed their name to Equifax.
(edited - ends at 13:30)

Breach Podcast: Equifax Data Breach - What Went Wrong

Season 2, Episode 3
Edited transcript

(edited - starts at 6:05)
ALIA: So I know it's far more complicated than this, but I kind of like Rick Smith's umbrellas of "Human Error" and "System Error" - I mean, it's kind of like Humans v. Machines, who's messed up more?

BOB: You can't really separate humans and machines. They're intertwined in a way that you can't break them out separately. Um, the machines only work as well as the humans tell them to and that's just how it- that's the truth. If there's a mistake that's made, they make it together.

ALIA: And oh my gosh did these co-dependent humans-plus-machines make some mistakes. Let's. Get. Into it!

NICK: So back in march of 2017, just to kind of step back from the breach itself back to what was happening at the time-

ALIA: There's a federal agency called -

NICK: US Computer Emergency Readiness Team, the US CERT.

BOB: So US CERT -- It's part of the Department of Homeland Security.

NICK: Which has responsibilities for cataloging vulnerabilities and then communicating that out to federal agencies and to the public -

BOB: And they do this so that private companies are aware when there's any weaknesses that have been discovered in the software that they rely on.

ALIA: Ok that's really cool. I don't think I knew that that was a thing.

BOB: This is an early warning system that's actually been around for a long time.

NICK: And so back in 2017, in March of that year, um, US CERT had actually put out a notice that had identified, um, that there had been a vulnerability in a type of software, actually a framework that's used, an open source framework, for, um, setting up sort of web traffic, if you will. And that's called the Apache Struts web framework.

ALIA: So, this is just a tool Equifax uses, a software framework that's called Apache Struts, right?

BOB: Yeah that's right, a lot of people use Apache Struts. Equifax used it in their online disputes portal. We talked about that last week, that's the part of Equifax's website where customers dispute inaccuracies in their credit report, all Big 3 Credit Reporting Agencies have one. What this means, if Struts has a vulnerability, that this part of Equifax's site also has a vulnerability - there's essentially an unlocked, open door in this Apache Struts software -

NICK: So they had notified everybody that this vulnerability existed, and a patch was available, which basically is a fix for that software to then work properly to kind of close the door where they had identified it being open.

BOB: So this notice is sent via email early March of 2017, it's sent to Equifax's "Global Threat and Vulnerability Management Team" and to CSO Susan Mauldin, along with the patch.

ALIA: "Hey your stuff's broken, here's how to fix it."

NICK: A couple days later -

ALIA: Still early March -

NICK: Attackers had, uh, been scanning out to, uh, identify any situations where the vulnerability had not been fixed and had encountered that equifax had servers that had been unpatched.

ALIA: So if you notify everybody that a vulnerability exists and that it needs patching, you're also kind of notifying the hackers.

BOB: It's a race between people--the good guys who fix computers and the bad guys who exploit them.

ALIA: So hackers are poking around discovering Equifax's unpatched servers as early as March-

NICK: It wasn't until May of that year in 2017 that the attackers actually started to use, that vulnerability.

ALIA: Are these the same hackers poking around in March and then breaching the data in May?

BOB: Maybe, maybe not, we don't actually know.

ALIA: But there were months in between -- Equifax could have patched those servers in early March and avoided this, right? I mean how long does it take to patch something?

BOB: Not that long. I mean, the patching itself could happen in instance. The process might take a day or two.

ALIA: Well why didn't they take that day? Why not do something about this in March?

RICK SMITH: I'm looking forward to answering your questions. Thank you.

BOB: In his written testimony to the House on October 3rd, Smith says that the government notified Equifax of the software bug on March 8, and the company notified all the relevant employees on March 9 - and Equifax policy is they had 48 hours to repair the software -- but, he says that no action was taken in response to this notification.

ALIA: Just…no one updated that one particular server.

NICK: Well, apparently the, um, the list of administrators, individuals that actually have the responsibilities for updating servers across equifax's company wasn't up to date. And so it had, uh, not included that the contact information for

some administrators that had come on board and had responsibilities in particular for the server that we, that we mentioned,

ALIA: The email list just wasn't up to date.

BOB: So approximately 430 individuals and distribution lists received this email - it instructed "Personnel responsible for Apache Struts installations to upgrade" appropriately.
But (some argue) the right people (whose job this was) weren't on the listserv.
And no one, presumably, noticed that and sent it to those people and said "fix this".

ALIA: When I think about the sexy world of cyber-security, I don't necessarily associate it with the administrative work of keeping your email listserv up to date when a new hire comes on, or someone leaves the company.
So all of you out there should be thanking those administratively gifted humans at your office who might be saving you from a breach.
(edited - ends at 11:13)

Unit 10 Lesson 8

Project - Innovation Simulation Part 4

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

Unit 10 contains an extended project that composes 7 of the 14 lessons in this unit. It serves a number of important goals:

1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

Lesson	Key Beats of the Lesson	Connection to the Project Guide	Other notes
U10L1: Project - Innovation Simulation Part 1	1. The teacher introduces the simulation and hands out “roles” to students. 2. Students explore what a computing innovation is and watch a video. 3. Students brainstorm innovations that might be useful to Future School. 4. Students reflect on their character’s role and what innovations their character might be most interested in.	Students finish Step 1 - Reflect of the Project Guide. The teacher models how to do Step 2 - Research of the Project Guide.	Students don’t do their own research on this day. That comes in the next lesson.
U10L2: Project - Innovation Simulation Part 2	1. The teacher hands out badges and nameplates from the previous lesson to get students into “simulation mode” 2. Students research three different computing innovations and discuss these innovations with team	Students finish Step 2 - Research of the Project Guide.	None.

	members.		
U10L3: Data Policies and Privacy *(Students do not work on the project during this lesson)*			
U10L4: The Value of Privacy *(Students do not work on the project during this lesson)*			
U10L5: Project - Innovation Simulation Part 3	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. The class watches a video about unintended consequences of computing innovations. 3. Students meet with their groups to discuss pros and cons of the different proposed innovations they researched in Step 2. 4. Students document the feedback they gave in Step 3 of the Activity Guide. 5. Students select one innovation which will ultimately become part of their groups’ vision for the Future School. 6. Students start to work on their One-pagers.	Students finish Step 3 - Feedback of the Project Guide. Students start Step 4 during this lesson. This step will be finished in U10L8.	This builds on previous lessons where students have considered ways that computing innovations may risk their privacy and have other unintended consequences. In future parts of this project, students will present their “vision” for the school of the future which includes each of these innovations that their team selects. Together, all of the innovations should help form a complete vision of what their team is proposing.
U10L6: Security Risks Part 1 *(Students do not work on the project during this lesson)*			
U10L7: Security Risks Part 2 *(Students do not work on the project during this lesson)*			
U10L8: Project - Innovation Simulation Part 4	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 4 in their Project Guide.	Students work on Step 4 - One-pager of the Project Guide. They should have most of it finished by the end of the lesson with the exception of the “Addressing Concerns” section which will be addressed later.	Students may leverage what they learned in U10L6 and U10L7 about security risks to identify “concerns” about their innovation in Step 4 of their Project Guide.
U10L9: Protecting Data Part 1 *(Students do not work on the project during this lesson)*			

U10L10: Protecting Data Part 2 *(Students do not work on the project during this lesson)*			
U10L11: Project - Innovation Simulation Part 5	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 5 in the Project Guide and put together a presentation focused on a theme for their vision for the Future School.	Students should mostly have Step 5 of the Project Guide done by the end of this lesson. They will get feedback on their presentation from Step 5 in the next lesson.	Students may leverage what they learned in U10L9 and U10L10 to finish the “Addressing Concerns” section of Step 4 of their Project Guide.
U10L12: Project - Innovation Simulation Part 6	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students break their group into smaller groups and present their ideas to a different small group. 3. Students give and get feedback from a different small group. 4. Students come back to their original groups and use the feedback they received to make changes to their presentations and one-pagers.	This is an opportunity for students to finish and revise any portions of Step 4 - One-pager and Step 5 - Preparing your Group Presentation in the Project Guide.	
U10L13: Project - Innovation Simulation Part 7	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students do short presentations of their proposals. 3. Students do a gallery walk to look at the proposals and the one-pagers other groups developed. 4. Students finish Step 7 in the Project Guide by voting for one “Overall Vision” and one “Innovation” that they felt was most compelling.	Students finish Step 6 and Step 7 of the Project Guide during this lesson.	Students should vote as their character. For example, if they were assigned a specific “Parent” role, they should vote as that parent. This is the last day of the simulation. Students will turn in their work at the end of the hour and turn in their name badges for the last time!
U10L14: Assessment Day *(Students do not work on the project during this lesson)*			

Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

Project Description

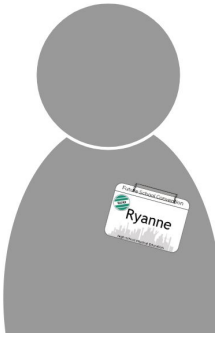
Welcome to the Future School Convention! You have been chosen to attend this convention because you represent an important stakeholder in the broader school community. Together with a small group you will brainstorm and research computing innovations that you believe will have a positive impact on schools. At the end of the convention, your team will pitch your best idea to a panel of judges.

Deliverables

- Individual:
  - This completed project guide
  - A computing innovation proposal
- Group:
  - An artifact displaying your team members' innovations
  - A presentation of the team's top innovation

Simulation

This project is a simulation where you and your classmates role play as delegates at a convention. There are times throughout this unit when you will be in simulation mode. Look for the red "Innovation Simulation" header at the top of slides as an indication of when the simulation is live. You should also wear your nametag and display your nameplate.



Step 1 - Reflection

My Character's Name	
My Role	
Consider what your character would want or need in a computing innovation for the Future School. Explain why.	

Step 2 - Research

Choose three different computing innovations you would like to recommend for the Future School. These can be innovations that were brainstormed as a team, or new ones that you think of. Check with your team to make sure no one is researching the same innovations.

Computing Innovation #1	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #2	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #3	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Step 3 - Feedback

In the space below record three pieces of feedback you gave to teammates about their proposed innovations and why you provided that feedback.

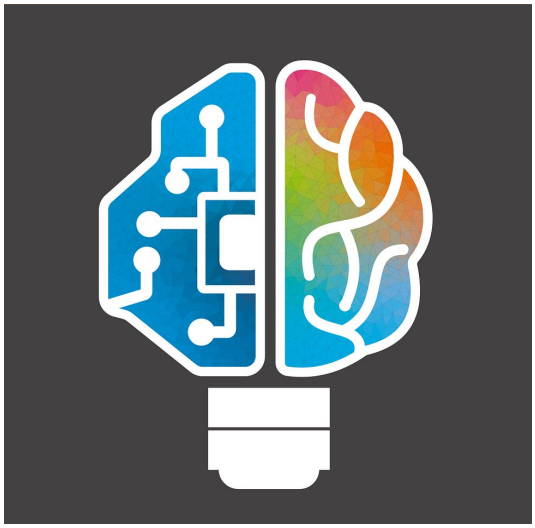
Innovation / Teammate	Feedback	Why You Gave It

Step 4 - One Pager

Based on the feedback you received, complete the one-pager on the next page for the innovation that best responds to your team's feedback and aligns with a unifying group theme or vision for the Future School.

Innovation One-Pager

<Name of the Innovation>



Replace the text above with the name of your innovation
Replace the image to the right with an image of your innovation

Purpose and Benefits
Write a paragraph or bullets explaining the reason the innovation exists. You should include:

- *The specific groups in the school community you believe would benefit*
- *The specific problems or challenge that group is facing*
- *The specific ways that group would benefit*
- *At least one specific reason your character would be interested in this innovation.*

Function
Write a paragraph or bullets explaining how the innovation actually works. You should include:

- *A high level description of how users interact with the innovation*
- *What data the innovation uses or collects*
- *How that data is processed and stored*

Concerns
Write a paragraph or bullets explaining potential concerns or risks posed by this innovation. You should include

- *At least one specific group that could potentially be harmed by the innovation and the way they could be harmed*
- *At least one specific privacy or security concern that arises from collecting the data needed to run your innovation.*

Addressing Concerns
Write a paragraph or bullets explaining the ways you could address potential concerns about your innovation. You should include:

- *Direct ties to the concerns raised in the previous paragraph*
- *At least one cybersecurity technique that could be used to make the innovation more secure*
- *Ways you would be willing to limit the innovation or alter its functionality to avoid the concerns*

Sources
List all sources that you used in making this project using the format below. Make sure to cite the source of your image.

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

Step 5 - Preparing Your Group Presentation

In addition to each group member submitting an innovation one-pager, your group will need to create some kind of collective artifact or presentation that presents your vision for the Future School.

Convention Format

- Presentations - 20-30 minutes
    - Each group will get between 2 and 4 minutes to present their vision for the Future School
- Gallery Walk - 10-15 minutes
    - Groups will leave their presentation materials and Innovation 1-Pagers around the room
    - All convention attendees will circulate the room reviewing 1-Pagers that feel particularly interesting to your character
- Voting / Feedback - 5 minutes
    - Each attendee will vote for the Group Vision and individual innovation they believe is best
    - Attendees may not vote for themselves or their group members

Presentation Format: Your presentation can be in almost any format you want. You could make a poster or slides, but you're also welcome to perform a skit, record a video, make a commercial, write a poem / song, or any other format that you think will be effective for communicating your vision. Aim for a presentation that is

- **Coherent:** Explains the theme that ties your different innovations together
- **Compelling:** Highlight the benefits of your vision and get the audience excited
- **Creative:** Choose the format that will best communicate your vision
- **Clear:** Make it clear specifically what you're proposing
- **Collaborative:** Every group member has a role, and every innovation is briefly explained
- **Concise:** You'll only have a couple minutes

Presentation Vision: What is the unifying theme of your group? What is the shared vision?

_____

_____

_____

Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

_____

_____

_____

Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

Step 7 - Evaluate

Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

Best Overall Vision: _____

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Project Guide - Analyzing Innovations	Clear evidence of having fully considered three potential innovations.	Evidence of having considered two innovations or incompletely considering three.	Evidence of only having considered one potential innovation.	No record of evidence of having considered multiple innovations.
Project Guide - Benefits and Harms	Steps 1 and 3 indicates thorough consideration of multiple innovations from the perspective of the character.	Steps 1 and 3 are occasionally incomplete or include a small number of comments disconnected from the character profile.	Steps 1 and 3 are incomplete or often disconnected from the character profile assigned.	No response in steps 1 and 3
One Pager - Purpose and Benefits	Response clearly indicates the purpose of the innovation and the specific groups that would benefit from it.	The response occasionally lacks clarity on the purpose of the innovation or does not specifically indicate a group that would benefit.	The response does not clearly indicate the purpose of the innovation or the specific groups that would benefit.	No response is given
One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
One Pager - Concerns	The response clearly explains one or more valid privacy or security concerns as well as the specific groups that would be harmed.	The response includes some incomplete or inaccurate information about the concern or the specific groups harmed.	The response includes significant factual inaccuracies about the privacy / security concern or does not indicate a specific group that is harmed.	No response is given
One Pager - Addressing Concerns	Response indicates understanding of an actual cybersecurity technique that directly addresses the concerns listed.	Response indicates understanding of a cybersecurity technique but it may not directly address the concerns lists.	Response either includes incorrect information or does not directly address the concerns listed.	No response is given
One Pager - Sources	Multiple sources of information are completely cited	Multiple sources are cited though in some cases incompletely	Sources are incompletely cited or one source is used.	No sources are cited
Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
Group Presentation - Clear and Compelling	The presentation and overall vision was both clear, briefly explaining each innovation, and compelling, highlighting the benefits of the overall vision.	The presentation was compelling but occasionally lacked clarity on what specifically was being proposed.	The presentation may not have been compelling or clear.	The presentation did little to highlight the benefits of the overall vision or clearly explain what was being proposed.

Unit 10 Lesson 9

Protecting Data Part 1

Resources

Unit 10 Lesson 10

Protecting Data Part 2

Resources

Name(s)_____ Period _____ Date _____

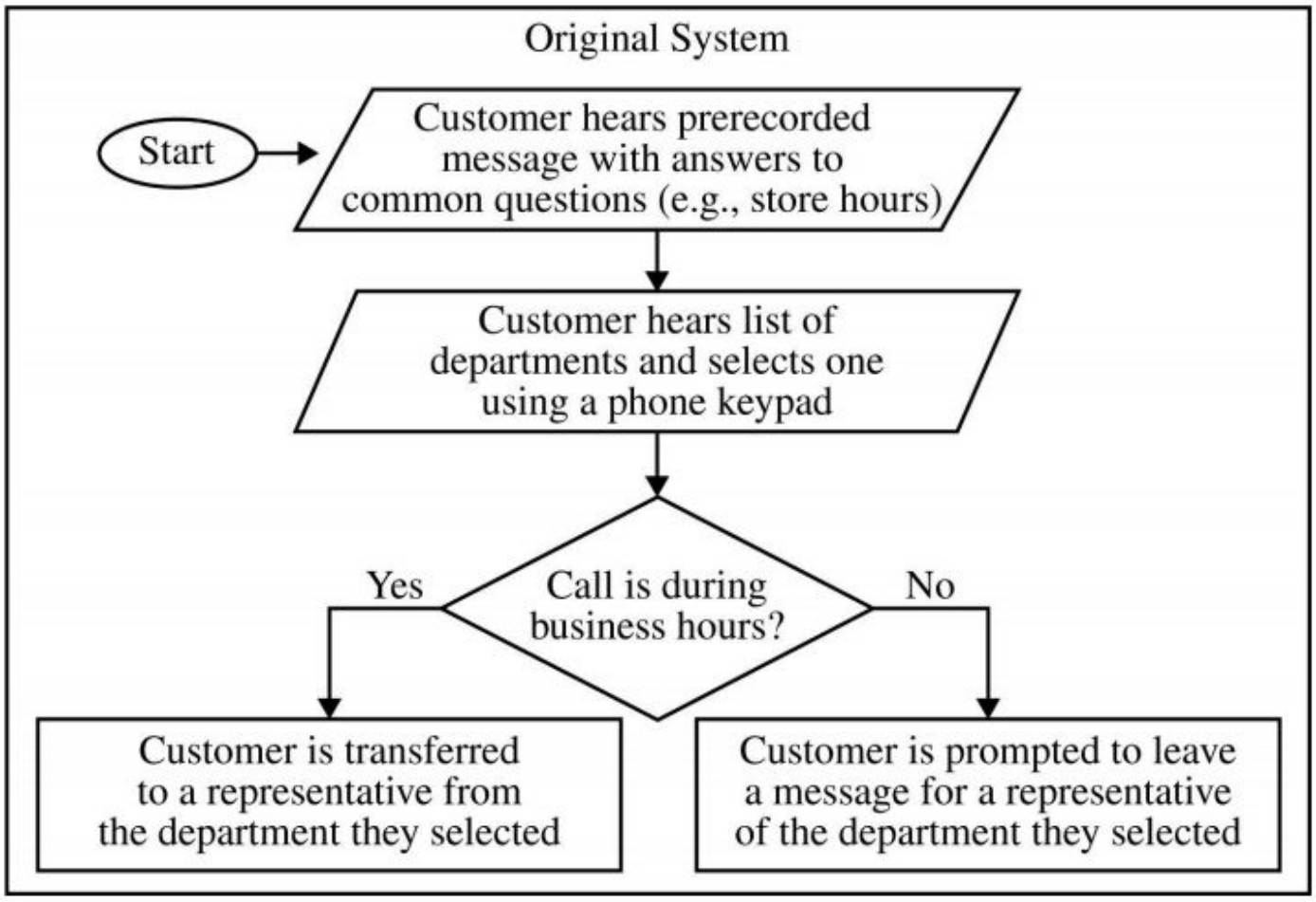
Reading Passage

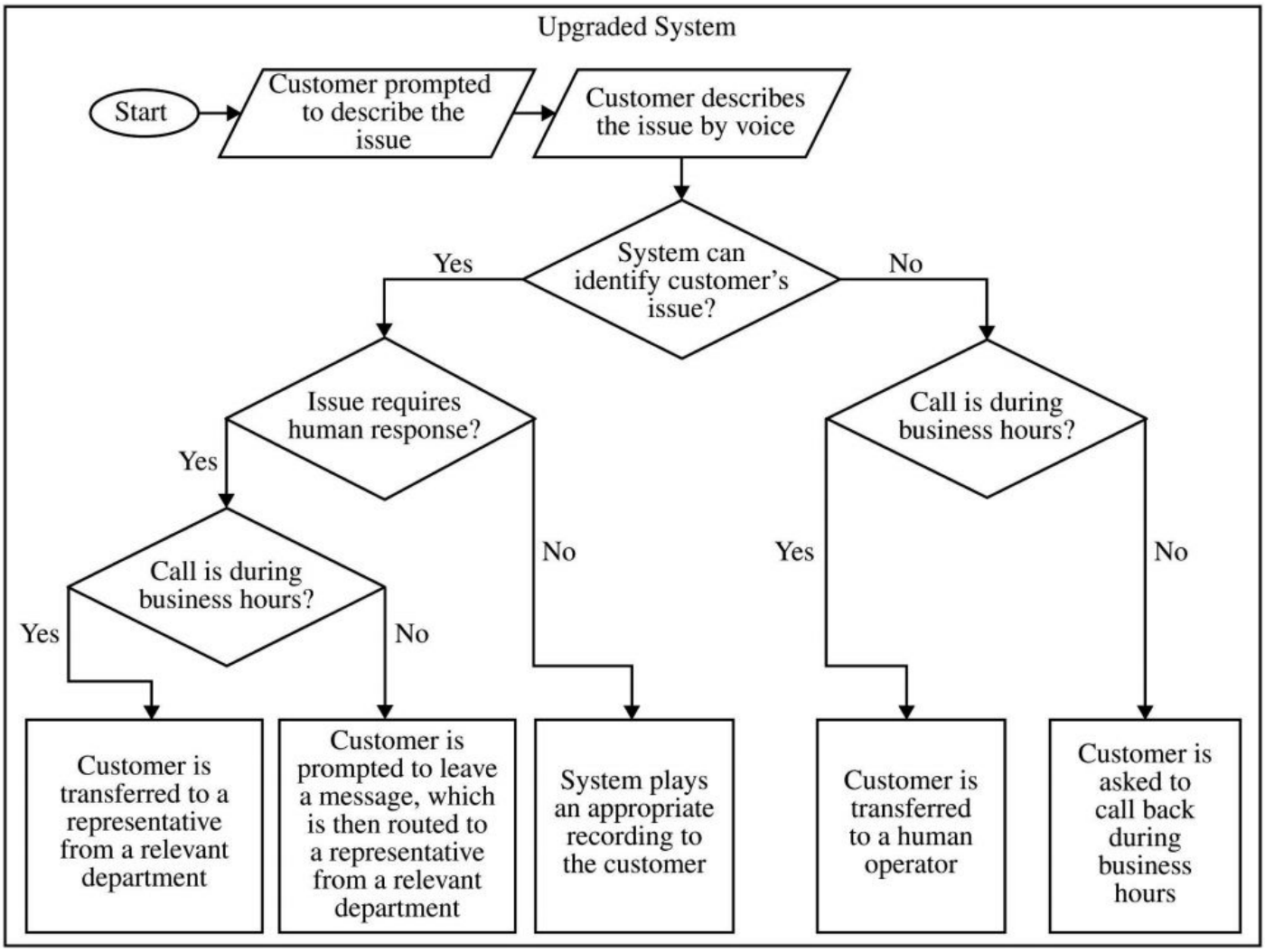
A chain of retail stores uses software to manage telephone calls from customers. The system was recently upgraded. Customers interacted with the original system using their phone keypad. Customers interact with the upgraded system using their voice.

The upgraded system (but not the original system) stores all information from the calling session in a database for future reference. This includes the customer's telephone number and any information provided by the customer (name, address, order number, credit card number, etc.).

The original system and the upgraded system are described in the following flowcharts. Each flowchart uses the following blocks.

Block	Explanation
Oval	The start of the algorithm
Parallelogram	An input or output step
Diamond	A conditional or decision step, where execution proceeds to the side labeled "Yes" if the answer to the question is yes and to the side labeled "No" if the answer to the question is no
Rectangle	The result of the algorithm




Upgraded System
Start
Customer prompted to describe the issue
Customer describes the issue by voice
System can identify customer's issue?
Yes
No
Issue requires human response?
Yes
No
Call is during business hours?
Yes
No
Call is during business hours?
Yes
No
Customer is transferred to a representative from a relevant department
Customer is prompted to leave a message, which is then routed to a representative from a relevant department
System plays an appropriate recording to the customer
Customer is transferred to a human operator
Customer is asked to call back during business hours

Unit 10 Lesson 11

Project - Innovation Simulation Part 5

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

Unit 10 contains an extended project that composes 7 of the 14 lessons in this unit. It serves a number of important goals:

1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

Lesson	Key Beats of the Lesson	Connection to the Project Guide	Other notes
U10L1: Project - Innovation Simulation Part 1	1. The teacher introduces the simulation and hands out “roles” to students. 2. Students explore what a computing innovation is and watch a video. 3. Students brainstorm innovations that might be useful to Future School. 4. Students reflect on their character’s role and what innovations their character might be most interested in.	Students finish Step 1 - Reflect of the Project Guide. The teacher models how to do Step 2 - Research of the Project Guide.	Students don’t do their own research on this day. That comes in the next lesson.
U10L2: Project - Innovation Simulation Part 2	1. The teacher hands out badges and nameplates from the previous lesson to get students into “simulation mode” 2. Students research three different computing innovations and discuss these innovations with team	Students finish Step 2 - Research of the Project Guide.	None.

	members.		
U10L3: Data Policies and Privacy *(Students do not work on the project during this lesson)*			
U10L4: The Value of Privacy *(Students do not work on the project during this lesson)*			
U10L5: Project - Innovation Simulation Part 3	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. The class watches a video about unintended consequences of computing innovations. 3. Students meet with their groups to discuss pros and cons of the different proposed innovations they researched in Step 2. 4. Students document the feedback they gave in Step 3 of the Activity Guide. 5. Students select one innovation which will ultimately become part of their groups’ vision for the Future School. 6. Students start to work on their One-pagers.	Students finish Step 3 - Feedback of the Project Guide. Students start Step 4 during this lesson. This step will be finished in U10L8.	This builds on previous lessons where students have considered ways that computing innovations may risk their privacy and have other unintended consequences. In future parts of this project, students will present their “vision” for the school of the future which includes each of these innovations that their team selects. Together, all of the innovations should help form a complete vision of what their team is proposing.
U10L6: Security Risks Part 1 *(Students do not work on the project during this lesson)*			
U10L7: Security Risks Part 2 *(Students do not work on the project during this lesson)*			
U10L8: Project - Innovation Simulation Part 4	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 4 in their Project Guide.	Students work on Step 4 - One-pager of the Project Guide. They should have most of it finished by the end of the lesson with the exception of the “Addressing Concerns” section which will be addressed later.	Students may leverage what they learned in U10L6 and U10L7 about security risks to identify “concerns” about their innovation in Step 4 of their Project Guide.
U10L9: Protecting Data Part 1 *(Students do not work on the project during this lesson)*			

U10L10: Protecting Data Part 2 *(Students do not work on the project during this lesson)*			
U10L11: Project - Innovation Simulation Part 5	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 5 in the Project Guide and put together a presentation focused on a theme for their vision for the Future School.	Students should mostly have Step 5 of the Project Guide done by the end of this lesson. They will get feedback on their presentation from Step 5 in the next lesson.	Students may leverage what they learned in U10L9 and U10L10 to finish the “Addressing Concerns” section of Step 4 of their Project Guide.
U10L12: Project - Innovation Simulation Part 6	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students break their group into smaller groups and present their ideas to a different small group. 3. Students give and get feedback from a different small group. 4. Students come back to their original groups and use the feedback they received to make changes to their presentations and one-pagers.	This is an opportunity for students to finish and revise any portions of Step 4 - One-pager and Step 5 - Preparing your Group Presentation in the Project Guide.	
U10L13: Project - Innovation Simulation Part 7	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students do short presentations of their proposals. 3. Students do a gallery walk to look at the proposals and the one-pagers other groups developed. 4. Students finish Step 7 in the Project Guide by voting for one “Overall Vision” and one “Innovation” that they felt was most compelling.	Students finish Step 6 and Step 7 of the Project Guide during this lesson.	Students should vote as their character. For example, if they were assigned a specific “Parent” role, they should vote as that parent. This is the last day of the simulation. Students will turn in their work at the end of the hour and turn in their name badges for the last time!
U10L14: Assessment Day *(Students do not work on the project during this lesson)*			

Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

Project Description

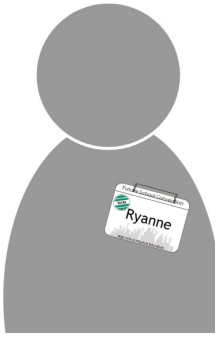
Welcome to the Future School Convention! You have been chosen to attend this convention because you represent an important stakeholder in the broader school community. Together with a small group you will brainstorm and research computing innovations that you believe will have a positive impact on schools. At the end of the convention, your team will pitch your best idea to a panel of judges.

Deliverables

- Individual:
  - This completed project guide
  - A computing innovation proposal
- Group:
  - An artifact displaying your team members' innovations
  - A presentation of the team's top innovation

Simulation

This project is a simulation where you and your classmates role play as delegates at a convention. There are times throughout this unit when you will be in simulation mode. Look for the red "Innovation Simulation" header at the top of slides as an indication of when the simulation is live. You should also wear your nametag and display your nameplate.



Step 1 - Reflection

My Character's Name	
My Role	
Consider what your character would want or need in a computing innovation for the Future School. Explain why.	

Step 2 - Research

Choose three different computing innovations you would like to recommend for the Future School. These can be innovations that were brainstormed as a team, or new ones that you think of. Check with your team to make sure no one is researching the same innovations.

Computing Innovation #1	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #2	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #3	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Step 3 - Feedback

In the space below record three pieces of feedback you gave to teammates about their proposed innovations and why you provided that feedback.

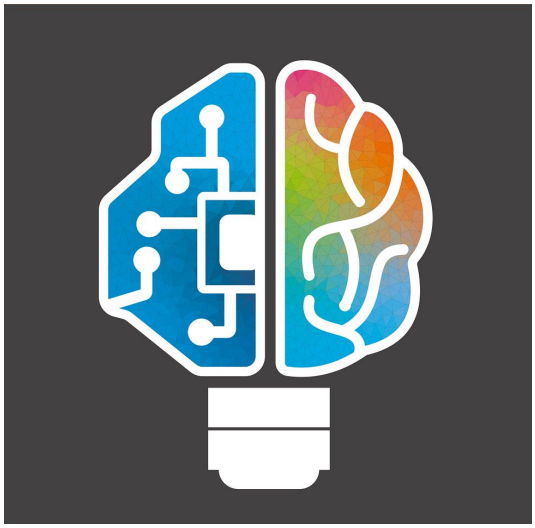
Innovation / Teammate	Feedback	Why You Gave It

Step 4 - One Pager

Based on the feedback you received, complete the one-pager on the next page for the innovation that best responds to your team's feedback and aligns with a unifying group theme or vision for the Future School.

Innovation One-Pager

<Name of the Innovation>



Replace the text above with the name of your innovation
Replace the image to the right with an image of your innovation

Purpose and Benefits
Write a paragraph or bullets explaining the reason the innovation exists. You should include:

- *The specific groups in the school community you believe would benefit*
- *The specific problems or challenge that group is facing*
- *The specific ways that group would benefit*
- *At least one specific reason your character would be interested in this innovation.*

Function
Write a paragraph or bullets explaining how the innovation actually works. You should include:

- *A high level description of how users interact with the innovation*
- *What data the innovation uses or collects*
- *How that data is processed and stored*

Concerns
Write a paragraph or bullets explaining potential concerns or risks posed by this innovation. You should include

- *At least one specific group that could potentially be harmed by the innovation and the way they could be harmed*
- *At least one specific privacy or security concern that arises from collecting the data needed to run your innovation.*

Addressing Concerns
Write a paragraph or bullets explaining the ways you could address potential concerns about your innovation. You should include:

- *Direct ties to the concerns raised in the previous paragraph*
- *At least one cybersecurity technique that could be used to make the innovation more secure*
- *Ways you would be willing to limit the innovation or alter its functionality to avoid the concerns*

Sources
List all sources that you used in making this project using the format below. Make sure to cite the source of your image.

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[3] ….

Step 5 - Preparing Your Group Presentation

In addition to each group member submitting an innovation one-pager, your group will need to create some kind of collective artifact or presentation that presents your vision for the Future School.

Convention Format

- Presentations - 20-30 minutes
    - Each group will get between 2 and 4 minutes to present their vision for the Future School
- Gallery Walk - 10-15 minutes
    - Groups will leave their presentation materials and Innovation 1-Pagers around the room
    - All convention attendees will circulate the room reviewing 1-Pagers that feel particularly interesting to your character
- Voting / Feedback - 5 minutes
    - Each attendee will vote for the Group Vision and individual innovation they believe is best
    - Attendees may not vote for themselves or their group members

Presentation Format: Your presentation can be in almost any format you want. You could make a poster or slides, but you're also welcome to perform a skit, record a video, make a commercial, write a poem / song, or any other format that you think will be effective for communicating your vision. Aim for a presentation that is

- **Coherent:** Explains the theme that ties your different innovations together
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- **Creative:** Choose the format that will best communicate your vision
- **Clear:** Make it clear specifically what you're proposing
- **Collaborative:** Every group member has a role, and every innovation is briefly explained
- **Concise:** You'll only have a couple minutes

Presentation Vision: What is the unifying theme of your group? What is the shared vision?

_____

_____

_____

Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

_____

_____

_____

Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

Step 7 - Evaluate

Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

Best Overall Vision: _____

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Project Guide - Analyzing Innovations	Clear evidence of having fully considered three potential innovations.	Evidence of having considered two innovations or incompletely considering three.	Evidence of only having considered one potential innovation.	No record of evidence of having considered multiple innovations.
Project Guide - Benefits and Harms	Steps 1 and 3 indicates thorough consideration of multiple innovations from the perspective of the character.	Steps 1 and 3 are occasionally incomplete or include a small number of comments disconnected from the character profile.	Steps 1 and 3 are incomplete or often disconnected from the character profile assigned.	No response in steps 1 and 3
One Pager - Purpose and Benefits	Response clearly indicates the purpose of the innovation and the specific groups that would benefit from it.	The response occasionally lacks clarity on the purpose of the innovation or does not specifically indicate a group that would benefit.	The response does not clearly indicate the purpose of the innovation or the specific groups that would benefit.	No response is given
One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
One Pager - Concerns	The response clearly explains one or more valid privacy or security concerns as well as the specific groups that would be harmed.	The response includes some incomplete or inaccurate information about the concern or the specific groups harmed.	The response includes significant factual inaccuracies about the privacy / security concern or does not indicate a specific group that is harmed.	No response is given
One Pager - Addressing Concerns	Response indicates understanding of an actual cybersecurity technique that directly addresses the concerns listed.	Response indicates understanding of a cybersecurity technique but it may not directly address the concerns lists.	Response either includes incorrect information or does not directly address the concerns listed.	No response is given
One Pager - Sources	Multiple sources of information are completely cited	Multiple sources are cited though in some cases incompletely	Sources are incompletely cited or one source is used.	No sources are cited
Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
Group Presentation - Clear and Compelling	The presentation and overall vision was both clear, briefly explaining each innovation, and compelling, highlighting the benefits of the overall vision.	The presentation was compelling but occasionally lacked clarity on what specifically was being proposed.	The presentation may not have been compelling or clear.	The presentation did little to highlight the benefits of the overall vision or clearly explain what was being proposed.

Unit 10 Lesson 12

Project - Innovation Simulation Part 6

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

Unit 10 contains an extended project that composes 7 of the 14 lessons in this unit. It serves a number of important goals:

1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

Lesson	Key Beats of the Lesson	Connection to the Project Guide	Other notes
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U10L2: Project - Innovation Simulation Part 2	1. The teacher hands out badges and nameplates from the previous lesson to get students into “simulation mode” 2. Students research three different computing innovations and discuss these innovations with team	Students finish Step 2 - Research of the Project Guide.	None.

	members.		
U10L3: Data Policies and Privacy *(Students do not work on the project during this lesson)*			
U10L4: The Value of Privacy *(Students do not work on the project during this lesson)*			
U10L5: Project - Innovation Simulation Part 3	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. The class watches a video about unintended consequences of computing innovations. 3. Students meet with their groups to discuss pros and cons of the different proposed innovations they researched in Step 2. 4. Students document the feedback they gave in Step 3 of the Activity Guide. 5. Students select one innovation which will ultimately become part of their groups’ vision for the Future School. 6. Students start to work on their One-pagers.	Students finish Step 3 - Feedback of the Project Guide. Students start Step 4 during this lesson. This step will be finished in U10L8.	This builds on previous lessons where students have considered ways that computing innovations may risk their privacy and have other unintended consequences. In future parts of this project, students will present their “vision” for the school of the future which includes each of these innovations that their team selects. Together, all of the innovations should help form a complete vision of what their team is proposing.
U10L6: Security Risks Part 1 *(Students do not work on the project during this lesson)*			
U10L7: Security Risks Part 2 *(Students do not work on the project during this lesson)*			
U10L8: Project - Innovation Simulation Part 4	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 4 in their Project Guide.	Students work on Step 4 - One-pager of the Project Guide. They should have most of it finished by the end of the lesson with the exception of the “Addressing Concerns” section which will be addressed later.	Students may leverage what they learned in U10L6 and U10L7 about security risks to identify “concerns” about their innovation in Step 4 of their Project Guide.
U10L9: Protecting Data Part 1 *(Students do not work on the project during this lesson)*			

U10L10: Protecting Data Part 2 *(Students do not work on the project during this lesson)*			
U10L11: Project - Innovation Simulation Part 5	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students work on Step 5 in the Project Guide and put together a presentation focused on a theme for their vision for the Future School.	Students should mostly have Step 5 of the Project Guide done by the end of this lesson. They will get feedback on their presentation from Step 5 in the next lesson.	Students may leverage what they learned in U10L9 and U10L10 to finish the “Addressing Concerns” section of Step 4 of their Project Guide.
U10L12: Project - Innovation Simulation Part 6	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students break their group into smaller groups and present their ideas to a different small group. 3. Students give and get feedback from a different small group. 4. Students come back to their original groups and use the feedback they received to make changes to their presentations and one-pagers.	This is an opportunity for students to finish and revise any portions of Step 4 - One-pager and Step 5 - Preparing your Group Presentation in the Project Guide.	
U10L13: Project - Innovation Simulation Part 7	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. Students do short presentations of their proposals. 3. Students do a gallery walk to look at the proposals and the one-pagers other groups developed. 4. Students finish Step 7 in the Project Guide by voting for one “Overall Vision” and one “Innovation” that they felt was most compelling.	Students finish Step 6 and Step 7 of the Project Guide during this lesson.	Students should vote as their character. For example, if they were assigned a specific “Parent” role, they should vote as that parent. This is the last day of the simulation. Students will turn in their work at the end of the hour and turn in their name badges for the last time!
U10L14: Assessment Day *(Students do not work on the project during this lesson)*			

Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

Project Description

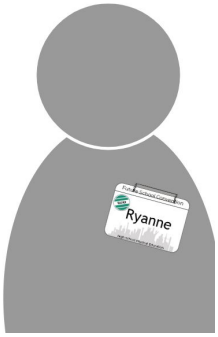
Welcome to the Future School Convention! You have been chosen to attend this convention because you represent an important stakeholder in the broader school community. Together with a small group you will brainstorm and research computing innovations that you believe will have a positive impact on schools. At the end of the convention, your team will pitch your best idea to a panel of judges.

Deliverables

- Individual:
  - This completed project guide
  - A computing innovation proposal
- Group:
  - An artifact displaying your team members' innovations
  - A presentation of the team's top innovation

Simulation

This project is a simulation where you and your classmates role play as delegates at a convention. There are times throughout this unit when you will be in simulation mode. Look for the red "Innovation Simulation" header at the top of slides as an indication of when the simulation is live. You should also wear your nametag and display your nameplate.



Step 1 - Reflection

My Character's Name	
My Role	
Consider what your character would want or need in a computing innovation for the Future School. Explain why.	

Step 2 - Research

Choose three different computing innovations you would like to recommend for the Future School. These can be innovations that were brainstormed as a team, or new ones that you think of. Check with your team to make sure no one is researching the same innovations.

Computing Innovation #1	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #2	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Computing Innovation #3	
Name:	
Purpose (why it exists):	**Function (how it works):**
Source(s)	**What data is being collected?**
My character would recommend this computing innovation because...	

Step 3 - Feedback

In the space below record three pieces of feedback you gave to teammates about their proposed innovations and why you provided that feedback.

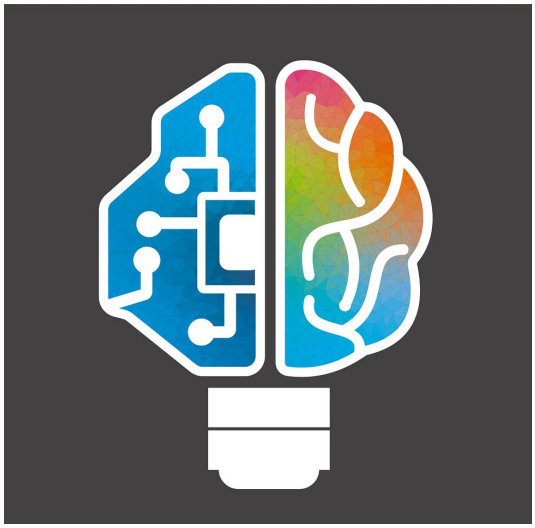
Innovation / Teammate	Feedback	Why You Gave It

Step 4 - One Pager

Based on the feedback you received, complete the one-pager on the next page for the innovation that best responds to your team's feedback and aligns with a unifying group theme or vision for the Future School.

Innovation One-Pager

<Name of the Innovation>



Replace the text above with the name of your innovation
Replace the image to the right with an image of your innovation

Purpose and Benefits
Write a paragraph or bullets explaining the reason the innovation exists. You should include:

- *The specific groups in the school community you believe would benefit*
- *The specific problems or challenge that group is facing*
- *The specific ways that group would benefit*
- *At least one specific reason your character would be interested in this innovation.*

Function
Write a paragraph or bullets explaining how the innovation actually works. You should include:

- *A high level description of how users interact with the innovation*
- *What data the innovation uses or collects*
- *How that data is processed and stored*

Concerns
Write a paragraph or bullets explaining potential concerns or risks posed by this innovation. You should include

- *At least one specific group that could potentially be harmed by the innovation and the way they could be harmed*
- *At least one specific privacy or security concern that arises from collecting the data needed to run your innovation.*

Addressing Concerns
Write a paragraph or bullets explaining the ways you could address potential concerns about your innovation. You should include:

- *Direct ties to the concerns raised in the previous paragraph*
- *At least one cybersecurity technique that could be used to make the innovation more secure*
- *Ways you would be willing to limit the innovation or alter its functionality to avoid the concerns*

Sources
List all sources that you used in making this project using the format below. Make sure to cite the source of your image.

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Step 5 - Preparing Your Group Presentation

In addition to each group member submitting an innovation one-pager, your group will need to create some kind of collective artifact or presentation that presents your vision for the Future School.

Convention Format

- Presentations - 20-30 minutes
    - Each group will get between 2 and 4 minutes to present their vision for the Future School
- Gallery Walk - 10-15 minutes
    - Groups will leave their presentation materials and Innovation 1-Pagers around the room
    - All convention attendees will circulate the room reviewing 1-Pagers that feel particularly interesting to your character
- Voting / Feedback - 5 minutes
    - Each attendee will vote for the Group Vision and individual innovation they believe is best
    - Attendees may not vote for themselves or their group members

Presentation Format: Your presentation can be in almost any format you want. You could make a poster or slides, but you're also welcome to perform a skit, record a video, make a commercial, write a poem / song, or any other format that you think will be effective for communicating your vision. Aim for a presentation that is

- **Coherent:** Explains the theme that ties your different innovations together
- **Compelling:** Highlight the benefits of your vision and get the audience excited
- **Creative:** Choose the format that will best communicate your vision
- **Clear:** Make it clear specifically what you're proposing
- **Collaborative:** Every group member has a role, and every innovation is briefly explained
- **Concise:** You'll only have a couple minutes

Presentation Vision: What is the unifying theme of your group? What is the shared vision?

_____

_____

_____

Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

_____

_____

_____

Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

Step 7 - Evaluate

Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

Best Overall Vision: _____

Rubric

Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
Project Guide - Analyzing Innovations	Clear evidence of having fully considered three potential innovations.	Evidence of having considered two innovations or incompletely considering three.	Evidence of only having considered one potential innovation.	No record of evidence of having considered multiple innovations.
Project Guide - Benefits and Harms	Steps 1 and 3 indicates thorough consideration of multiple innovations from the perspective of the character.	Steps 1 and 3 are occasionally incomplete or include a small number of comments disconnected from the character profile.	Steps 1 and 3 are incomplete or often disconnected from the character profile assigned.	No response in steps 1 and 3
One Pager - Purpose and Benefits	Response clearly indicates the purpose of the innovation and the specific groups that would benefit from it.	The response occasionally lacks clarity on the purpose of the innovation or does not specifically indicate a group that would benefit.	The response does not clearly indicate the purpose of the innovation or the specific groups that would benefit.	No response is given
One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
One Pager - Concerns	The response clearly explains one or more valid privacy or security concerns as well as the specific groups that would be harmed.	The response includes some incomplete or inaccurate information about the concern or the specific groups harmed.	The response includes significant factual inaccuracies about the privacy / security concern or does not indicate a specific group that is harmed.	No response is given
One Pager - Addressing Concerns	Response indicates understanding of an actual cybersecurity technique that directly addresses the concerns listed.	Response indicates understanding of a cybersecurity technique but it may not directly address the concerns lists.	Response either includes incorrect information or does not directly address the concerns listed.	No response is given
One Pager - Sources	Multiple sources of information are completely cited	Multiple sources are cited though in some cases incompletely	Sources are incompletely cited or one source is used.	No sources are cited
Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
Group Presentation - Clear and Compelling	The presentation and overall vision was both clear, briefly explaining each innovation, and compelling, highlighting the benefits of the overall vision.	The presentation was compelling but occasionally lacked clarity on what specifically was being proposed.	The presentation may not have been compelling or clear.	The presentation did little to highlight the benefits of the overall vision or clearly explain what was being proposed.

Unit 10 Lesson 13

Project - Innovation Simulation Part 7

Resources

The big picture of the Unit 10 extended simulation

Project high-level goals

Unit 10 contains an extended project that composes 7 of the 14 lessons in this unit. It serves a number of important goals:

1. It helps contextualize what students are learning by moving from abstract ideas of privacy or security to concrete potential innovations. Since the simulation is based around the question of modernizing schools, students are able to consider the consequences of computing innovations in a familiar setting.
2. It helps empower students to more adeptly see and weigh the consequences of the technology around them. Many of the young people who take CS Principles may pursue studies or careers in which they are "creators" with technology, but all of them will need to be thoughtful "deciders" in a world that is profoundly shaped by computing.

Connecting the lessons to one another and to the Project Guide

As you do this unit with your students, it is important to understand how each of the individual lessons involving the project connect to each other. This guide provides a high level overview of the “beats” of the lesson, how the lesson is connected to the Project Guide that students will work on throughout the Unit and other important notes. As always, you should read the complete lesson plan for each of these lessons as well, but this should help you make sense of the project overall.

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U10L5: Project - Innovation Simulation Part 3	1. The teacher hands out badges and nameplates to get students into “simulation mode”. 2. The class watches a video about unintended consequences of computing innovations. 3. Students meet with their groups to discuss pros and cons of the different proposed innovations they researched in Step 2. 4. Students document the feedback they gave in Step 3 of the Activity Guide. 5. Students select one innovation which will ultimately become part of their groups’ vision for the Future School. 6. Students start to work on their One-pagers.	Students finish Step 3 - Feedback of the Project Guide. Students start Step 4 during this lesson. This step will be finished in U10L8.	This builds on previous lessons where students have considered ways that computing innovations may risk their privacy and have other unintended consequences. In future parts of this project, students will present their “vision” for the school of the future which includes each of these innovations that their team selects. Together, all of the innovations should help form a complete vision of what their team is proposing.
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Name(s)_____ Period _____ Date _____

Project Guide - Innovation Simulation

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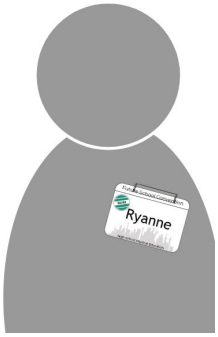

Step 1 - Reflection

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Purpose (why it exists):	**Function (how it works):**
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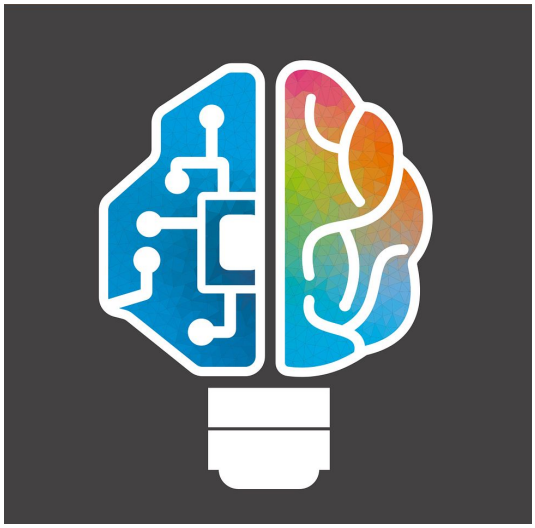

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- **Coherent:** Explains the theme that ties your different innovations together
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Presentation Vision: What is the unifying theme of your group? What is the shared vision?

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Step 2 - Your Innovation's Connection to the Theme: Write down the connection between your innovation and the theme or vision your team has chosen.

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Step 6 - Run the Convention

During the convention, every group will have a chance to present their vision and you'll then review individual innovations.

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Vote for the group vision and individual innovation **your character believes is most compelling**. You may not vote for yourself, your team, or other members of your team.

Best Innovation: _____

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One Pager - Function	The response is clear, accurate, and highlights the way the innovation works, the data it uses, and how that data is used.	The response may occasionally lack clarity or detail on the way the innovation works or how it uses data.	The response lacks significant details or does not clearly indicate the way that the innovation works.	No response is given
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Group Presentation - Coherent and Collaborative	Each group member has a role in the presentation and the overall vision clearly ties together the different innovations.	Most group members have a role in the presentation and there is a unifying vision tying most innovations together.	Some but not all group members have a role in the presentation. The vision may only connect some innovations.	Most group members do not participate in the presentation and there is no evidence of a unifying vision.
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Unit 10 Lesson 14

Assessment Day

Resources