STEM Careers Coalition

CLASSROOM ACTIVITY

Staying Informed

OBJECTIVES

Students will be able to:

- **Research** and **describe** the impact of climate change on human health
- **Identify** key details that will help the public understand and protect themselves from these health risks
- **Design** wireframes for an app that communicates this timely public health information
- **Review, critique,** and **modify** designs from the perspective of a user experience expert

OVERARCHING QUESTION

How can we inform the public of environmental health risks?

ACTIVITY SUMMARY

Students will examine the health risks associated with climate change. They will identify two key risks as well as what the public can do to maintain their health despite these hazards. Students will ultimately create a design for an app that communicates this health information.

MATERIALS

- How Climate Affects Community Health video, to project
- Climate Effects on Health webpage, to project
- Designing Solutions Handout, one per student
- Devices with internet access, at least enough for half of the class
- Copy paper, about 50 sheets

CHALLENGE

1. Begin with a popcorn share* around the question: What factors affect human health? As students share, keep notes of their ideas on the board.

   *In a popcorn share, students voluntarily "pop" out of their seats to give a brief answer. As one speaker sits down to signal that they are finished speaking, the next person may pop up and share.

2. After a couple minutes have passed, reflect on the brainstorming list and consider if anyone mentioned the environment as a factor that affects human health. If so, circle the idea. If not, bring up the environment as an additional factor that affects health. Then instruct students to think-pair-share*: How could the environment affect our health and wellbeing?

   *In a think-pair-share, students think about the question independently, discuss their answers with a partner, and then share their thoughts with the larger class.

3. Then play the How Climate Affects Community Health video and instruct students to listen for additional factors that they may not have discussed with their partner.
4. Tell students that today they will take on the role of an app designer who has been challenged to create an app that will inform the public about how the environment affects their health and what they can do to stay healthy.
5. Distribute one Designing Solutions Handout to each student and then elaborate on the challenge by reading aloud the bullets listed under *Step 1: Define the Challenge*. Explain that students will complete this challenge with a partner.
6. After answering questions, prepare student groups to perform research to better understand the challenge:
    - Project the Climate Effects on Health webpage and scroll down to the Impact of *Climate Change on Human Health* image. Explain that students should consider these categories, and ultimately select two on which to focus for their app
    - Instruct students to continue using this webpage to perform their research. If the URL is not visible on the projected image, write it on the board: cdc.gov/climateandhealth/effects/default.htm
    - Explain that student pairs will have about 10–15 minutes to perform research. At the end of the research period, each student should have a better idea of the environmental factors that affect human health *and* ways people can prepare for and/or prevent these effects. Encourage pairs to divide the research responsibilities and remind students to only take notes on information that may be relevant to the challenge

DESIGN

1. Bring the class back together and explain that it's now time to develop a solution to the challenge. The student app designers will accomplish this by creating wireframes of their app! Explain that a wireframe is a paper-based blueprint that shows each screen of the app. A wireframe does not normally include color or imagery. These details are included during the next phase of app development.
2. Call on a student to read the handout's *Step 2: Create a Design* section aloud.
3. Then distribute a few sheets of copy paper to each pair, and explain that students can create a wireframe for each page of their app on a separate piece of paper.
4. Tell the class that they will have about 15 minutes to select two health factors from their research and develop wireframes. Quickly recap and encourage students to:
    - Use their research notes to decide which health factors to tackle *and* how humans can protect themselves from these dangers.
    - Consider what important and concise information they want to relay to the public in order to help them stay healthy.

SOLVE

1. When there are about 15 minutes left in the class period, randomly place pairs into groups of four. Explain that an important part of the app design process is a User Experience (or UX) review. During this review, an app's design and functionality is analyzed from the perspective of a user so improvements and modifications can be made to ensure the app is as user-friendly as possible.

2. Explain that students should follow these general steps to complete their UX review:
    - As each pair of app designers share their work, the other pair will pretend to be UX reviewers.
    - The app designers must explain how their app will function as well as the information that it will portray.
    - The UX reviewers will listen carefully to the designers' explanation and suggest at least two ways to make the app more user-friendly or informative.
    - Remember that the ultimate goal of the solution is to create an easy and informative app that will help people stay healthy amidst environmental challenges!
3. Go on to explain that once both sets of wireframes have been reviewed, pairs should complete the *Step 3: Analyze Solutions* portion of the handout, and consider how to optimize their design to make it more user-friendly. If time permits, they may edit or redraw their designs.

STANDARDS

Next Generation Science Standards

- Earth and Human Activity
    - ESS3.C: Human Impacts on Earth Systems: Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
- Engineering Design
    - Cross-Cutting Concepts—Influence of Science, Engineering, and Technology on Society and the Natural World:
        - All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ETS1-1)
        - The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (MS-ETS1-1)

ITEEA Technological Literacy Standards

- Standard 1: Students will develop an understanding of the characteristics and scope of technology. In order to comprehend the scope of technology, students should learn that:
    - F. New products and systems can be developed to solve problems or to help do things that could not be done without.
    - G. The development of technology is a human activity and is the result of individual and collective needs and the ability to be creative.
- Standard 8: Students will develop an understanding of the attributes of design. In order to comprehend the attributes of design, students should learn that:

- E. Design is a creative planning process that leads to useful products and systems.

- Standard 17: Students will develop an understanding of and be able to select and use information and communication technologies. In order to select, use, and understand information and communication technologies, students should learn that:
  - J. The design of a message is influenced by such factors as the intended audience, medium, purpose, and nature of the message.

DESIGNING SOLUTIONS

STEP 1: DEFINE THE CHALLENGE

As an app designer, your challenge is to:

1. Identify two ways that the environment affects human health.
2. For each factor, explain key facts that the public should be aware of in order to stay healthy.
3. Create a design for a health-based app that will inform people of these health effects and any steps people should take to stay as healthy as possible.

Note: You can decide whether the app will be the same for all users or whether the app will take the user's location into account.

List brainstorming and research notes that could help you tackle the challenge:

STEP 2: CREATE A DESIGN

Work with your partner to select two environmental health effects. Then use the space below to brainstorm the details and elements that your app will include to educate the public about these health effects.

Once you have a plan, create three wireframes for your app on separate sheets of paper: one wireframe for the landing screen and one wireframe for each health effect. Each wireframe must contain:

- Clear and concise copy (e.g. the text that will appear on the app screen)
- Functionality (buttons, scrolls, etc., and an explanation of what the page will do)
- Blank squares where images will be, with a brief description of what the imagery will be
- Any additional information that the app developer will need to know as they build the app

STEP 3: ANALYZE SOLUTIONS

Think about the UX feedback your wireframes received and consider how you could improve your app design. Describe at least one design optimization below: