FUTURE U.

ecoAction Virtual Field Trip

Objectives

Students will:

- Create a timeline that summarizes the focus of Earth Day since its inception in 1970.
- Perform research to understand how individuals, communities, and companies can positively affect the environment.
- Compare and contrast the individual and collective power of climate change action.
- Participate in a citizen science project and articulate their role in furthering the environmental initiative.

Overview

Join Discovery Education and Boeing as we celebrate the 50th anniversary of Earth Day: the worldwide event focused on promoting clean living and a healthy, sustainable habitat for humans and wildlife. The first Earth Day in 1970 mobilized millions of Americans to take action to improve the environment and is credited with launching the modern environmental movement. Fifty years later, Earth Day is now focusing on climate change action as citizens around the world unite to tackle the biggest challenge to the future of our planet.

During this Virtual Field Trip (VFT), students will investigate the themes of air, land, water, and waste as they explore how they can do their part to improve the environment as well as how a large company like Boeing is doing its part, too. Students will be transported to several locations in Washington state for an exclusive behind-the-scenes look at some of the ways Boeing is using innovation, research, advanced technology, and engineering to boost its environmental performance and drive a more sustainable future. As students visit these different locations, they will be introduced to Boeing employees and other experts who are working on sustainability in the air, on land, in the water, and in handling and reducing waste.

The pre-field trip activity in this companion guide is designed to introduce students to the themes they will learn about during the VFT. The activities designed for completion during and post viewership connect and extend student learning to classroom concepts, sustainability, and global citizenship.

Time Frame

Two-to-three class periods

National Standards

Next Generation Science Standards

MS-ESS3 Earth and Human Activity

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- Disciplinary Core Ideas:
    - ESS3.C: Human Impacts on Earth Systems: Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.
    - ESS3.D: Global Climate Change: Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.

ITEEA Standards for Technological Literacy

- Standard 1: Scope of Technology. In order to comprehend the scope of technology, students in Grades 6-8 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 the help of technology.

Common Core English Language Arts

- R.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
- W.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Pre-VFT Activity

Materials

- Device with the ability to project, one for the instructor
- Fifty Years of Earth Days handout, enough for half the class
- Devices with Internet access, at least enough for half the class

Begin by projecting two Earth Day advertisements that have run i*n The New York Times:* one from the very first Earth Day in 1970 and one for 2020. Reiterate that this year is the 50th anniversary of Earth Day and encourage students to compare/contrast the two ads.

Then distribute a Fifty Years of Earth Days handout to student pairs. Explain that each pair should work together to follow the handout's directions and learn more about the history and evolution of Earth Day.

During the Virtual Field Trip

Materials

- Sustainable Actions handout, one per student

Distribute one Sustainable Actions handout to each student and review the directions provided. Explain that these notes will be used in an activity that follows the VFT, so students should listen and note carefully as they participate in the Saving the EcoAction Virtual Field Trip.

Post Virtual Field Trip Activities

Activity 1: Uniting for Change

Materials

- Devices with Internet access, at least enough for half the class
- Uniting for Change handout, enough for half the class
- Venn Diagram handout, enough for half the class

Divide students into pairs and distribute one Uniting for Change handout and one Venn Diagram handout to each pair. Instruct students to follow the directions provided to further research climate action and explore how companies, communities, and individuals can make a difference.

Once students have completed Part 2, bring the class back together and hold a full-class discussion around their answer to: Do you believe climate actions performed by individuals, communities, companies, or a combination of the three have the potential to make the biggest difference? Why?

Activity 2: Making Change Happen

Materials

- Devices with Internet access, at least enough for half the class
- Become a Citizen Scientist handout, one per student

Briefly review how Boeing is collaborating with communities and individuals around the world to protect the environment. Then explain that opportunities also exist to help students unite with others and contribute to environmental causes on a larger scale. One example is Citizen Science! Ask students to brainstorm: What comes to mind when you hear the term Citizen Scientist?

Explain that a citizen scientist is an individual—a child, a student, a teenager, or an adult—who contributes their time to scientific research. These individuals don't need a formal science background in order to help perform important tasks in collaboration with scientists.

Then ask: Why may citizen scientists be important? How could someone without a science background help scientists? Help students arrive at an understanding that science relies on observation. The more people who can record observations and share data, the better! By having people around the world use technology to share their observations, scientists are able to accomplish much more than they ever could themselves.

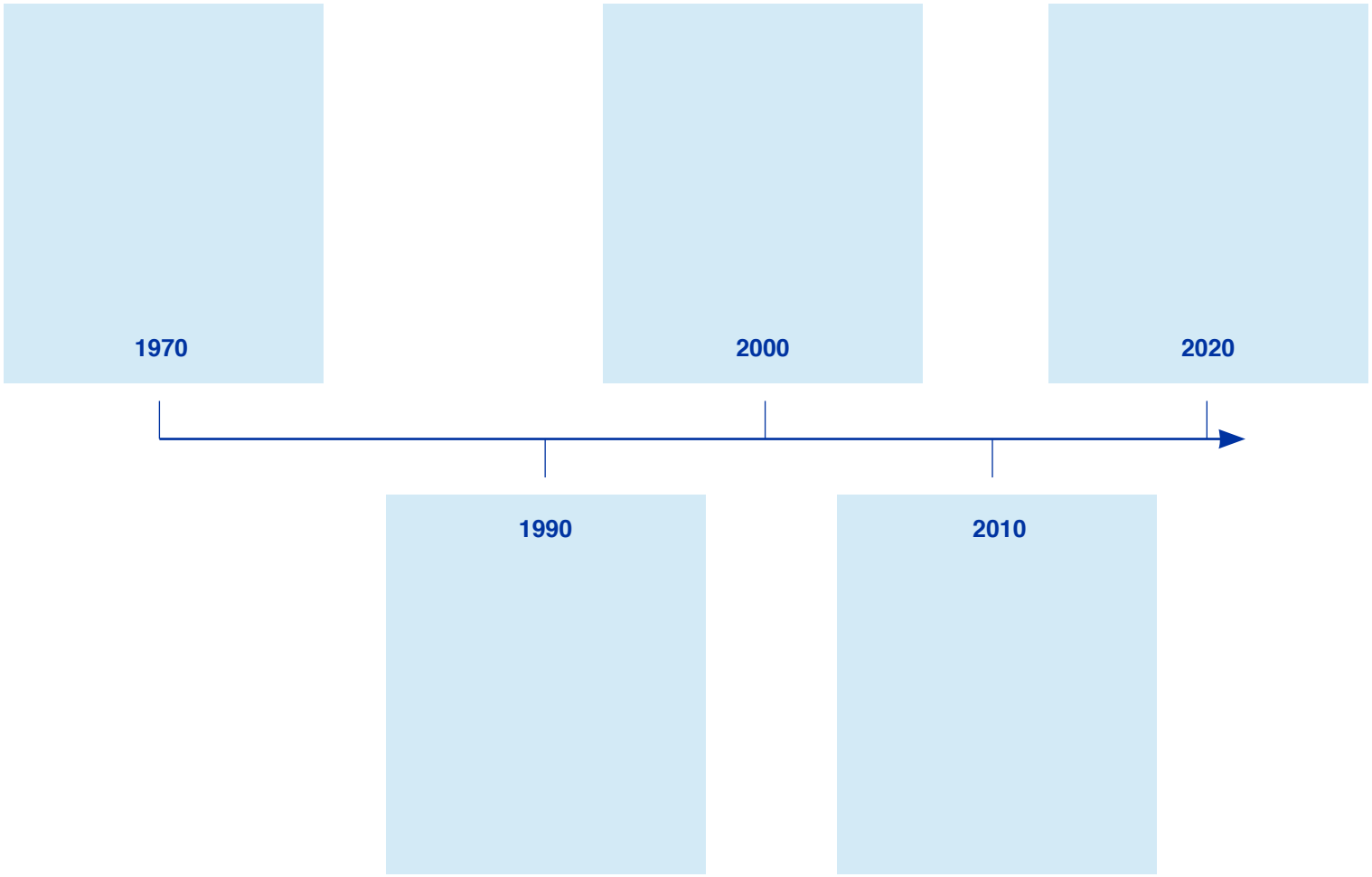
Distribute one Become a Citizen Scientist handout to each student, and review the directions provided. Then instruct students to work independently or in pairs to find and begin contributing to their own climate-based citizen science project!

Pre-Activity: Fifty Years of Earth Days

1. On April 22, the world will celebrate Earth Day's 50th birthday. Visit earthday.org/history to learn more about why Earth Day began and how it has evolved over the years.

   As you read about the significance of 1970, 1990, 2000, 2010, and 2020 in the history of Earth Day, pause and record five or six key words in the boxes below that describe why each of these years were (or will be) important.

   Hint: There is already a timeline included on this webpage. You may refer to this as a starting point but be sure to include other important details from the text!



2. Once your timeline is complete, discuss with your partner: How has Earth Day's focus changed over the years? How has it stayed the same?

During Activity

Directions: During the EcoAction Virtual Field Trip, you will explore how air, water, land, and waste are connected to sustainability. Record brief notes in the chart below as you learn about actions that positively impact the environment in each of these categories.

Then consider whether each action is—or could be—completed by companies, communities, or individuals, and make a tally in the appropriate box(es). One example is provided for you!

Air

Shape alloy metals can be used to help airplane fins move. This reduces drag, which in turn lowers the airplane's fuel use and its carbon emissions!

Companies	Communities	Individuals

Water

Companies	Communities	Individuals

Land

Companies	Communities	Individuals

Waste

Companies	Communities	Individuals

Post-Virtual Field Trip Activity #1: Uniting for Change

Part 1: With a partner, complete the steps below:

1. On your Venn Diagram handout, circle the sustainability focus area that most interests you.
2. Review the notes that you recorded about this focus area during the EcoAction Virtual Field Trip. You should have an example of Boeing's environmental actions, and you may have additional examples of how communities and/or individuals can also make a difference. Consider where these actions should be placed in your Venn Diagram, and add each one.
3. Perform Internet research to further understand how individuals, communities, and companies can positively affect your sustainability focus area, beginning with the following website(s):
    - Water: bit.ly/sustainablewateruse
    - Land: bit.ly/landandsustainability
    - Waste: bit.ly/productionandconsumption
    - Air:
        - bit.ly/airandsustainablecities
        - bit.ly/airandcleanenergy

    As you learn more, continue to fill in your Venn Diagram.
4. Finally, apply what you have learned and brainstorm additional actions that individuals, communities, and/or companies could take to positively impact this area of sustainability. Be sure to consider how these groups could collaborate to effect positive change and add these ideas to your Venn Diagram.

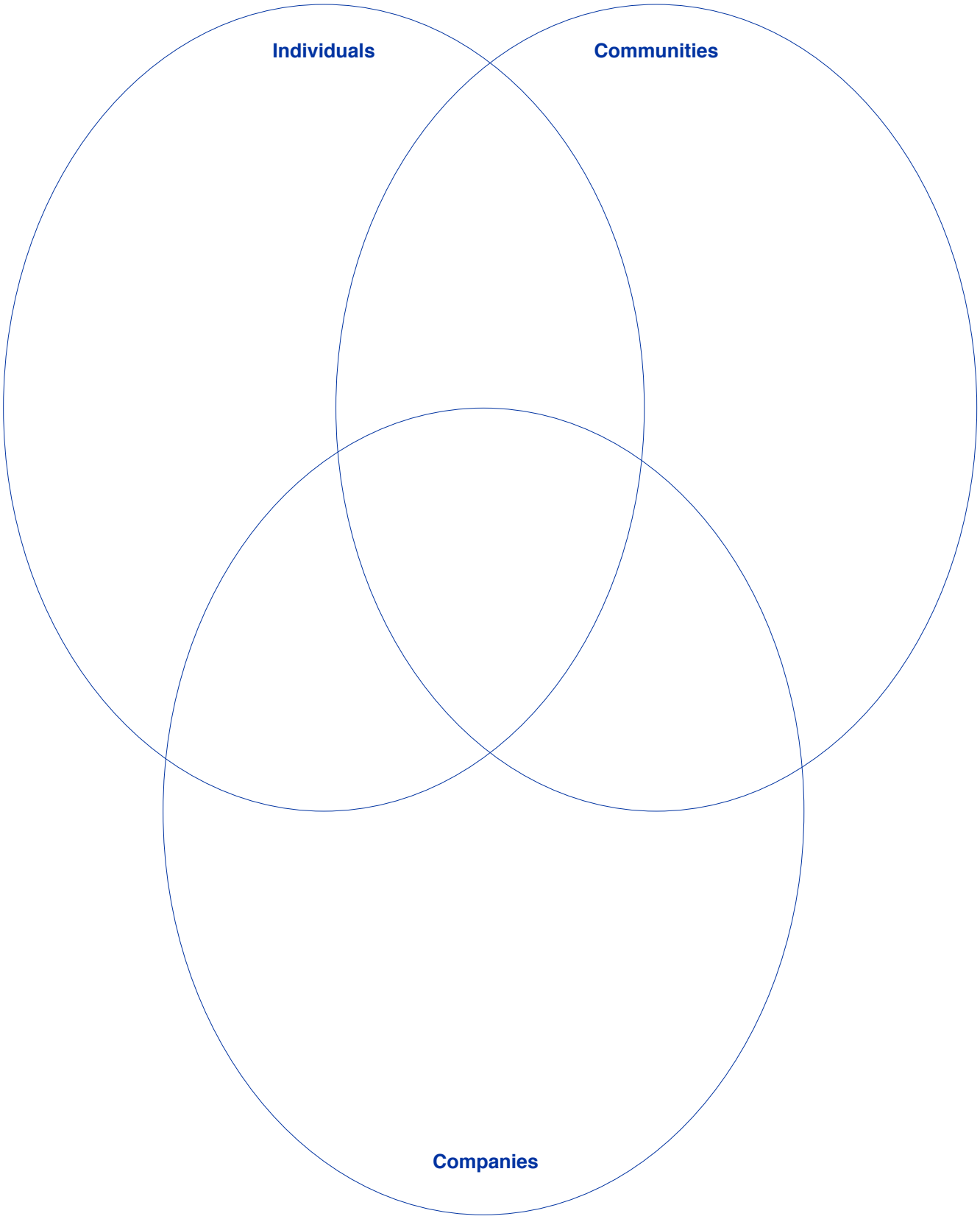
Part 2: Join with another student pair to form a small group, and complete the following:

1. Share your completed Venn Diagram handout with each other. What similarities and differences do you notice? Could you change the position of any of your information?

2. Do you believe climate actions performed by individuals, communities, companies, or a combination of the three have the potential to make the biggest difference? Why?

Post-Virtual Field Trip Activity #1: Venn Diagram

Sustainability Focus Area (circle one): land water air waste



Post-Virtual Field Trip Activity #2: Become a Citizen Scientist

Directions: Follow the directions below to start contributing to local and global environmental initiatives:

1. Visit SciStarter.org.
2. In the *Find a Project* box on the right side of the webpage, click *Advanced Search*.
3. Filter your search by the following three criteria:
   - *Select a topic: Ecology and the Environment and Climate and Weather*, in addition to any other topics that interest you
   - *Only projects that: Can be done online*
   - *Age group:* Select the age group that best describes you

   Then click *Find Projects*.
4. Browse the results, and click to learn more about at least three projects. Look for initiatives that interest you *and* that will help scientists learn more about environmental issues related to land, water, air, and/or waste.
5. Select one project that you would like to contribute to. Use its website to investigate the initiative further, and then record a quick summary in the space below. Be sure to include:
   - The goal(s) of the initiative
   - How the initiative will further science's understanding of the environment and why this understanding is important
   - Your role as a citizen scientist
   - How your role will contribute to the initiative's goal

6. Share your summary with your teacher. Then follow the website's instructions and begin your work as a citizen scientist!