



FUTURE U.

Citizen Astronaut

GRADE RANGE 6–8

Objective

After collaborating to explore different citizen science projects and begin one of their own, students will independently create an action plan to ensure they continue contributing to the project in the future.

Overview

Students will investigate how using technology connects scientists, engineers, and citizens across the country and around the globe by contributing to an out-of-this-world citizen science project! Students will first explore the term “citizen scientist” and learn about the variety of important ways that they, as students, can contribute to the world of science. The facilitator will preview a few of NASA’s citizen science projects before one is selected through a class-wide vote. Students will then take the first steps in contributing to this project and will wrap up by developing a plan that outlines how they will continue contributing to this project in the future.

STEM Topics

Science, Technology

Timing

45–60 minutes

Materials Needed

- Device with internet access and the ability to project
 - Note: At least one device will be needed. If the school has enough devices available for students to work in groups of three, two, or independently—even better!
- Citizen Astronaut Action Plan handouts, 35 copies

Preparation

- Check with the classroom teacher about projection capabilities. In some cases, it may be easiest for you to send the website link to the teacher in advance. In other cases, you may be able to easily connect your laptop.
- Check with the classroom teacher about device availability. Will there be one classroom device or will there be other devices available for students to use? Discussing this with the teacher ahead of time, if possible, may increase the likelihood that students will have devices to use.

- Familiarize yourself with NASA's Citizen Scientist [Homepage](#) and the gist of the projects below:
 - [Aurosaurus](#)
 - [Backyard Worlds](#)
 - [CosmoQuest](#)
 - [Disk Detective](#)
 - [Measure and Map Our Galaxy](#)
 - [Stardust](#)
- Connect with the teacher ahead of time to copy the handout.
- Take a moment to read through the lesson directions, but don't worry about following all directions precisely. Student engagement may lead you temporarily off-course, and that's okay! Just make sure you choose your class project by the time there are 25 minutes left in class.

Next Generation Science Standards

Dependent upon which citizen science project is selected

Standards for Technological Literacy

Standard 1: Scope of Technology

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.

Standard 13: Assess the Impact of Products and Systems

F. Design and use instruments to gather data.

I. Interpret and evaluate the accuracy of the information obtained and determine if it is useful.

Standard 17: Information and Communication Technologies

H. Information and communication systems allow information to be transferred from human to human, human to machine, and machine to human.

Procedure

- 1. Warm-Up Activity:** Tell students that you are going to read four statements. If or when they think one is true, they should stand up. Between statements, students should return to their seats.
 - a.** Environmentalists are collecting Stream Selfies—pictures of you and any stream you come across—to help them check the health of every stream in the country.
 - b.** NASA is asking kids and adults of all ages to help them sort through telescope and satellite imagery so they can learn more about Star formation.
 - c.** Scientists are calling all dog-owners to report back on games you play with your dog to help the world of science better understand the inner-workings of dogs' minds.
 - d.** At any point, *you*—even if you haven't graduated college, high school, or even middle school—could contribute to one of thousands of science projects...from your computer, from your home, and from your community.

2. Tell students that ALL of the statements were true! Each project is part of the citizen scientist movement. Ask: What comes to mind when you hear the term “Citizen Scientist”? What or who do you think a citizen scientist is? Ask students to discuss this with the person next to them.
3. After a couple minutes have passed, ask for volunteers to share their thoughts.
4. Look for commonalities among the students’ answers and eventually 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 to have a formal science background in order to help perform important tasks in collaboration with scientists!
5. Ask: Why do you think citizen scientists are important? How could someone without a science background help scientists? Call on student volunteers for ideas. 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!
6. Project NASA’s Citizen Scientist [Homepage](#) and explain that NASA is just one of the many organizations that works with citizen scientists. Scroll through this page and explain that each of these projects is calling on everyday citizens to help with space-related investigations. Share that they will get to participate in one of these projects.
7. **If only one classroom device is available:** Tell students that as a class, you will learn more about a few of the projects before selecting one. Call on student volunteers to point out projects on NASA’s homepage that look intriguing. Depending on the class’ interests, spend 5–10 minutes clicking through to different projects to see what they entail. Hovering over the thumbnail image on the homepage will bring up a small description, and clicking on the thumbnail will bring you to the project’s homepage.

During your full-class investigation, try to explore at least a couple of the following projects (all of which are available via NASA’s homepage), as these can be easily completed in a classroom setting:

- Aurosaurus: “Did you see an aurora? Be part of a world-wide reporting system that will help us understand how activity on the sun will affect the Earth.”
- Backyard Worlds: “Undiscovered planets and other smaller celestial objects may lurk in the distant reaches of our solar system. Help us search for new objects beyond our planet.”
- CosmoQuest: “Help NASA analyze more than 1.5 million images taken by astronauts on the International Space Station! This is a task only a human like you can accomplish!”
- Disk Detective: “Help us find where new planets are forming around distant stars using heat images from the Wide-Field Infrared Survey Explorer.”
- Measure and Map Our Galaxy: “We need your help looking through tens of thousands of images from the Spitzer Space Telescope. By telling us what you see in these infrared data, you will help scientists better understand how stars form.”
- Stardust: “In 2006, a capsule from the Stardust spacecraft returned to earth with samples taken from a comet’s tail. Help us search through images to find the first pristine interstellar dust particles ever brought to Earth!”

*Note: As science needs are always evolving, it’s possible that one or more of these projects no longer exists or may have changed requirements at different points in time. Continue on to another one of the many other available projects if this occurs!

If enough devices are available for students to work in small groups, pairs or individually:

Write the website URL on the board ([science.nasa.gov/citizen scientists](http://science.nasa.gov/citizen-scientists)) and give students about 10 minutes to explore the different projects. Instruct students to look for one that sparks their interest as well as one that looks possible to complete in school. Remind students that they are not beginning a project at this moment; they are investigating their options.

8. When there are 25–30 minutes left in class, bring students back together. Create a list of projects that would be feasible to begin as a class. (If you are unsure, don't hesitate to click on the project's link quickly and investigate together.) Once you have a list, instruct students to close their eyes and vote on the one that the class will complete together.
9. Then it's time to get started! Click on the project's link and spend about 15 minutes kicking off the citizen science project. If students have their own devices, they may follow along with you as you project. Some projects may ask you to register before you begin, others may have a short tutorial, and some may simply provide short instructions before you can get to work. Ask for student input through each step of the process, and allow students to take turns participating by using your device.
10. When there are just over 10 minutes left in class, wrap up what you are doing. Explain that while you are only there for one class period, this contribution to aerospace is something that the students can easily continue themselves. With the help of volunteers, like the students in this class, more and more scientific advancements can be made and at a faster pace than ever before.
11. Pass out the Citizen Astronaut Action Plan, and direct students to work independently or in pairs to create a plan for how they can continue to contribute to this science project beyond the end of the class period. It may be helpful to write the program's website and/or any log-in information you created on the board so students can copy it.
12. **Wrap Up:** When there are a couple minutes left in the period, ask students to share how they will continue contributing to this project. Then conclude by bringing their attention to the website on the bottom of the handout. Explain that in addition to continuing this project, there are countless others out there that also need their help. Students can use the website scistarter.com to search for additional projects that interest them!

Name of the Citizen Science Project: _____

Website: _____

Log-in Information (if applicable): _____

Looking Ahead:

1. Think about what your class already accomplished. Then consider: How can you continue contributing to this citizen science project? (In other words: What has your class not yet completed? Or, what could you continue to do?)

2. Where could you work on this citizen science project?

At home At the library Other: _____

3. How often can you commit to working on this citizen science project? Even a few minutes every few days will make a difference! Set a goal for yourself below:

Mondays	Tuesdays	Wednesdays	Thursdays	Fridays	Saturdays	Sundays
_____minutes	_____minutes	_____minutes	_____minutes	_____minutes	_____minutes	_____minutes

Interested in contributing to additional citizen science projects? Check out Scistarter.com: With a searchable database of over 2,700 different projects, it's a great place to start!