



CITIZEN science

Citizen Scientists for the Internet
Lesson 1 of 4

Overview

One might think that advancements in various scientific fields are made only by professional scientists without requiring help from ordinary people. However, there are many cases where ordinary people from different communities have contributed in many different ways to various science projects and helped out professional scientists. We use terms like 'Citizen Scientist' to refer to these everyday folks who become amateur scientists and help professional scientists with important science projects.

In this lesson, students will learn what citizen science is and how they can be science heroes by becoming citizen scientists themselves.



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Standards

Standards are based on fifth-grade learning standards unless otherwise specified.

Computer Science

CSTA 1B-IC-18
CSTA 1B-IC-19
CSTA 1B-DA-07

CSTA Standards: <https://www.csteachers.org/page/standards>
AZ Computer Science:
https://www.azed.gov/sites/default/files/2018/10/Arizona%20Computer%20Science%20Standards_3_5_Final%2006.24.2019.pdf?id=5bc90a611dcb2510102f55b8

Social Justice

AC.3-5.20

Learning for Justice:
<https://www.learningforjustice.org/sites/default/files/2021-11/LFJ-2111-Social-Justice-Standards-Anti-bias-framework-November-2021-11172021.pdf>

English Language Arts

AZ 5.RI.2
AZ 5.W.1

AZ English Language Arts:
<https://www.azed.gov/sites/default/files/2016/12/5th%20Grade%20ELA%202016%20Final.pdf?id=585aa90eaadebe12481b8443>

Math

AZ Math:
https://www.azed.gov/sites/default/files/2016/12/Math%20Final%2005Fifth%20Grade%20Standards%204_2_2018.pdf?id=58546f66aadebe13008c1a31

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Social Science

AZ History and Social Studies:

<https://www.azed.gov/sites/default/files/2018/10/3-5%20Grade%20Band%20Standards%20at%20a%20Glance%206.10.19.pdf?id=5bd772a61dcb250b94e916ef>

Learning Outcomes

By the end of this lesson, students will be able to:

- Explain what citizen science is
- Illustrate how citizen scientists can help make scientific advancements
- Devise how they themselves can be citizen scientists and become science heroes in their communities

Background

Big Ideas

- We can be science heroes by participating in real science research projects.
- We can use the Meteor App to measure the Internet to challenge inequalities and inaccurate measurements

Pre-Lesson Prep for Teachers

Explore Meteor App using the Week 5: Day 1 Lesson

Read <https://www.timeforkids.com/g34/you-can-do-it/?rl=en-610>

Watch <https://prezi.com/v/8iqbgasoqveh/>

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Lesson Plan

Total time: 32 minutes

Time	Teacher is...	Students are...	Materials needed
7 minutes	<p>Introducing the concept of citizen science as a way for regular people—even fifth graders!--to be science heroes in their communities</p> <p>Some questions to get started</p> <ul style="list-style-type: none"><input type="checkbox"/> <i>Do you know what citizen science is?</i><input type="checkbox"/> <i>Can you think of any citizen science projects?</i> <p>This would be a good time to introduce some citizen science projects. Here are links to a couple that are really well known:</p> <p>https://www.audubon.org/conservation/history-christmas-bird-count</p> <p>https://www.timeforkids.com/g34/you-ca</p>	Listening to the teacher, asking questions, answering questions	A space for students to sit in a circle

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	<p>n-do-it/?rl=en-610</p> <p>This could be a great place to connect the idea that citizen scientists are science heroes—and kids can be science heroes, too.</p>		
7 minutes	<p>Showing students this video: https://prezi.com/v/8igbgasoqveh/</p> <p>The video introduces a call from scientists to help measure the internet.</p> <p>Introduce this as a request for students to take on a science hero challenge.</p>		
15 minutes	<p>Handing out measurement campaign planning worksheet.</p> <p>This is a worksheet that your students will begin in class and then take home to work on and bring back for class with Ms. Wells next week.</p> <p>Show the students that there is a QR code that can let them install the Meteor App at home on another</p>		

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	device if they want to try it out. They should be taking home iPads to do this at home, too.		
3 minutes	Guiding students to complete an exit ticket: <input type="checkbox"/> Which place are you most excited to measure and why?		

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Become a Science Hero—Measure the Internet!

Name: _____ Date: _____

1. List Places

When computer scientists measure the Internet, they start by making a list of places where they want to measure. These could be places that are important to them or places where they think the Internet might not work very well.

We will get you started by having you think of some different places where you might be able to measure as a citizen scientist.

1. A place where you sleep _____

Predictions about how well the Internet works in this place:

2. A place where you play _____

Predictions about how well the Internet works in this place:

3. A place where your family lives _____

Predictions about how well the Internet works in this place:

4. A place where you work on schoolwork _____

Predictions about how well the Internet works in this place:

5. A place where you think the Internet might not work well _____

Predictions about how well the Internet works in this place:

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2. Create Route

Now you will create an ordered list of which places you will visit first. When computer scientists do this, they like to create an order that will take the shortest amount of travel time from place to place. In what order will you visit places where you want to measure?

- 1.
- 2.
- 3.
- 4.
- 5.

3. Go Measure!

Now that you have a route, use the Meteor App on your iPad to go start collecting measurements. Record your measurements on the measurement recording sheet.

You can also install the Meteor App on a device at home if you want to get your family and friends to join you.

For Android



For iOS



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Assessment Ideas

Quiz Questions and Answers

Use these questions in whatever format you use in your class to check for understanding, including Kahoot, iClicker, or Google Classroom quizzes.

Q: A citizen scientist can be:

- A. Anyone (child or adult) from any community
- B. Only people who have studied science throughout high-school and college
- C. Someone who wants to help scientists by observing events, gathering specimens, or collecting scientific data
- D. A and C**
- E. All of the above
- F. None of the above

Q: How can you become a citizen scientist using the meteor app?

Ans: By collecting accurate Internet measurement data in areas in my community.

Reflection Questions

You can use these in whatever format you use in your class for reflection, including science journals, Near Pods, exit tickets, or in Exploratory Talking Circles.

Why do you think it is important to have citizens be involved with science projects?

Why types of citizen science projects would you be interested in being part of? Why?