What is citizen science?

Citizen science is the practice of ordinary people participating in the scientific process by addressing real world problems that are often in their own community. Citizen scientists formulate research questions, conduct scientific experiments, collect and analyze data, interpret results, make new discoveries, develop technologies and applications, and solve complex problems.

Citizen scientists help the traditional scientific community by crowdsourcing, or using a large group of people as reference, information so they can collect larger amounts of data.

Please watch this video about citizen scientists and why they are important.

https://www.youtube.com/watch?v=SZwJzB-yMrU

1. When did science become a full-time career and why?
2. Who is a citizen scientist?
3. Explain what is going on with the North American Breeding Bird Survey and citizen scientists
4. How do you volunteer your computer to do citizen science?
5. How did a game help solve issues with creating RNA in the lab?

After watching the video

A. What is something in our community that we could study in a citizen science study?

Follow one of the links below to find citizen science projects that are currently happening:

https://www.citizenscience.gov/catalog/#

https://science.nasa.gov/citizenscience

B. Describe one project you found and how citizen scientists can participate

What is a survey?

Surveys are a way of "sampling" what the general public thinks about a certain issue. Questions are written, either to be yes/no, true/false, or open-ended. The results are compiled, and it's determined what people think or are willing to express opinions about.

Surveys can be a step in creating a citizen science project!

What is an issue in your community you think you could solve using citizen science methods?

Key Topic: Contamination/pollution prevention, Groundwater, Water availability/water use, Water conservation, Water management, Water quality

Grade Level: This activity can be adapted for many age groups and settings

Duration: 30 minutes

Objectives

Develop critical-thinking skills through creating questions for a survey

Items Needed:

• Paper
• Writing utensil

Optional: computer with access to internet

Activity Steps:

1. Divide the students into groups and assign each group a specific topic in your community that focuses on water, for example: groundwater contamination, water conservation, water uses, etc.
2. Each group should develop questions that deal with their individual topic. Offer some example questions to get the groups started, such as:

- Do you leave the tap running when you brush your teeth? (Never, sometimes, often)

- Do you think your water bill is too high? (Yes, no)
- Do you worry about water pollution and why?
- What do you think this community's greatest potential contaminant is (chemicals, oil, sediment, micro-plastics, other)?
- Do you use face or body wash that contains micro-plastics? (yes, no)

3. Once the groups have finished developing their questions, combine the questions into one survey. Make copies of the survey or have the students hand copy the survey questions onto a piece of paper. This can also be done online using GoogleDocs and GoogleForms.
4. Give students a few days to poll family members, friends, neighbors, etc. Each student should poll between five and ten people. More data is better!
5. When students bring the surveys back, have them compile the responses. Have the students create percentages for each question. For example, if 12 out of 25 people surveyed said they sometimes leave the tap running while they brush their teeth, what percentage is this (12 divided by 25)?
6. Discuss the results: what trends can you can identify? What do the results tell us - what water issues do people care about? Could they be more informed in a certain area? Is one age group more likely to respond to the survey one way than another. For example, do more parents leave the water running while they brush their teeth than kids do?
7. As a group, decide what you could do with the information you just learned.

For More Fun:

- Have students graph the results of the survey and develop charts to visually display the information.
- Confer the survey to people in your school. Have the students develop an educational campaign about the material in your survey - students can create posters to hang around the school, or provide presentations to share information. After the educational campaign is over, survey the same group again and see how the results changed.
- Ask student to consider the demographic they are polling, and how the results may be different if they were asking a different group of people, or people from a different community.
- Encourage students to use the information they have compiled to write a letter to local government officials or their state representation expressing their concerns over water pollutants/water conservation. Engaging with policy makers encourages students to become informed and engaged citizens.

Sources:
https://www.epa.gov/citizen-science/basic-information-about-citizen-science-0
https://www.scientificamerican.com/citizen-science/

https://www.citizenscience.gov/about/#