Science4Pandemics Teaching Guide

This is material addressed to schools to present Science4Pandemics, to educate students on preparedness and management of future pandemics and to involve them in citizen science initiatives.

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a citizen science project

eit Health

Co-funded by the European Union

Didactic Unit

Citizen Science: young people game changers

START

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Citizen Science: young people game changers

The didactic unit 'Citizen Science: young people game changers' aims to increase the student's education about the core concepts of **citizen science and collaborative research.** It will incorporate specific activities of citizen science, while the students can be providers of data at the same time that they are developing their knowledge about the benefits of citizen science, the roles of the citizen scientists and the relationship between citizen science and the scientific method.

To whom is directed: Students between 12 and 18 years old.

Knowledge area: Scientific area

Unit objectives:

- To increase the knowledge of basic citizen science concepts to improve the awareness of the importance of collaborative research.
- To take part in data collection by developing the specific activities of citizen science incorporated in the unit.
- To generate scientific vocation and motivation in regards to being part of a real scientific project.

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Citizen Science: young people game changers

Competences:

- **Information processing and management:** consists of finding, gathering and analysing information related to citizen science.
- **Research competence:** consists of applying the appropriate knowledge and analysing informational resources to find answers to a given task.
- **Critical thinking.**
- **Decision making.**
- **Communication skills.**

Concepts:

- Core concepts about citizen science and collaborative research.

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Training sessions

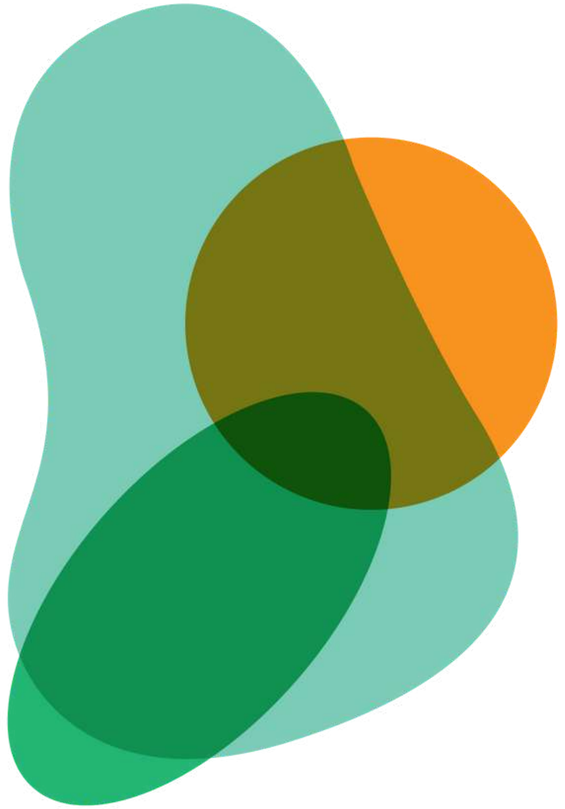
Each one will be developed on a concrete day. Before beginning them, all the students must have finished the registration process on the S4P platform.

- **Session 1:** Developing a citizen science activity related to quantifying the degree of vaccine hesitancy in teenagers.

- **Session 2:** Answering the questionnaire about vaccine hesitancy after having played the game.

- **Session 3:** Developing a citizen science activity related to assessing preferences for the use of digital technologies in clinical trial participation in children aged from 12 to 17 years old.

- **Session 4:** Learning about citizen science.



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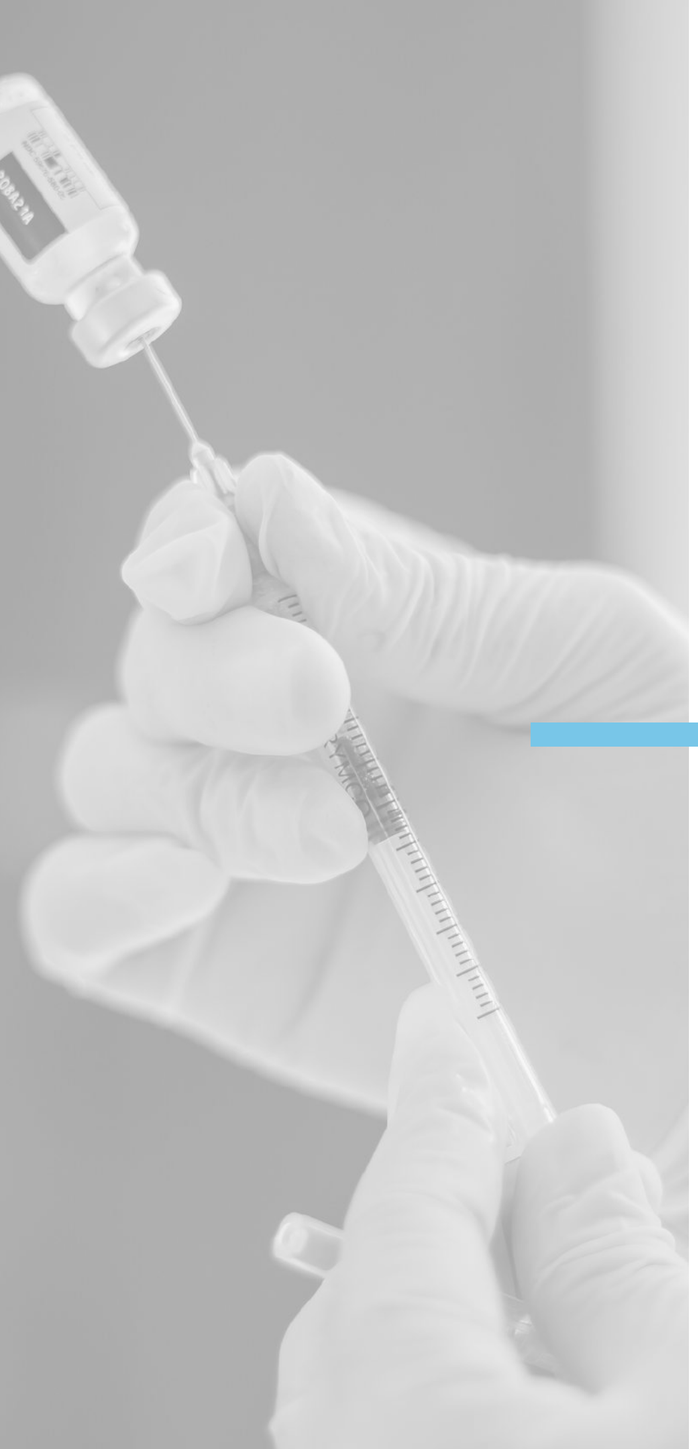

Session 1

VACCINE HESITANCY

Developing a citizen science activity related to quantifying the degree of vaccine hesitancy in teenagers.

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Session 1

PRESENTATION

Vaccines are one of the most effective public health tools available and have enabled the development of the world as we know it today. Every year, they prevent 3.5 to 5 million deaths from diseases such as measles, tetanus, whooping cough, influenza, and diphtheria. Despite this, there is a lot of misinformation around them, especially on social media, which can affect how young people perceive vaccines.

To better understand this issue and to be able to combat it with real data, the citizen science platform Science4Pandemics has launched a questionnaire aimed at children aged 12 - 18, as well as their parents, to find out how young people perceive vaccines.

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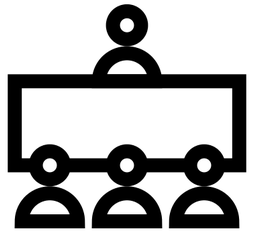
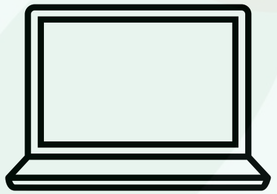
Session 1

GENERAL INFORMATION

Duration: 25 minutes.



Each student will carry out the activity on their own.



The students will need a device (laptop, tablet, mobile phone).

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Session 1

DESCRIPTION

Phase	Recommended duration	Session 1: Developing a citizen science activity related to quantifying the degree of vaccine hesitancy in teenagers.
1	5’	**Presentation of Science4Pandemics through a video.**
2	15'	**Answering the questionnaire about vaccine hesitancy without having any prior information.**
3	5'	**To encourage students to play the Science4Pandemics game at home within the next week.**

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Session 1

DESCRIPTION - PHASE 1

Presentation of Science4Pandemics through a video

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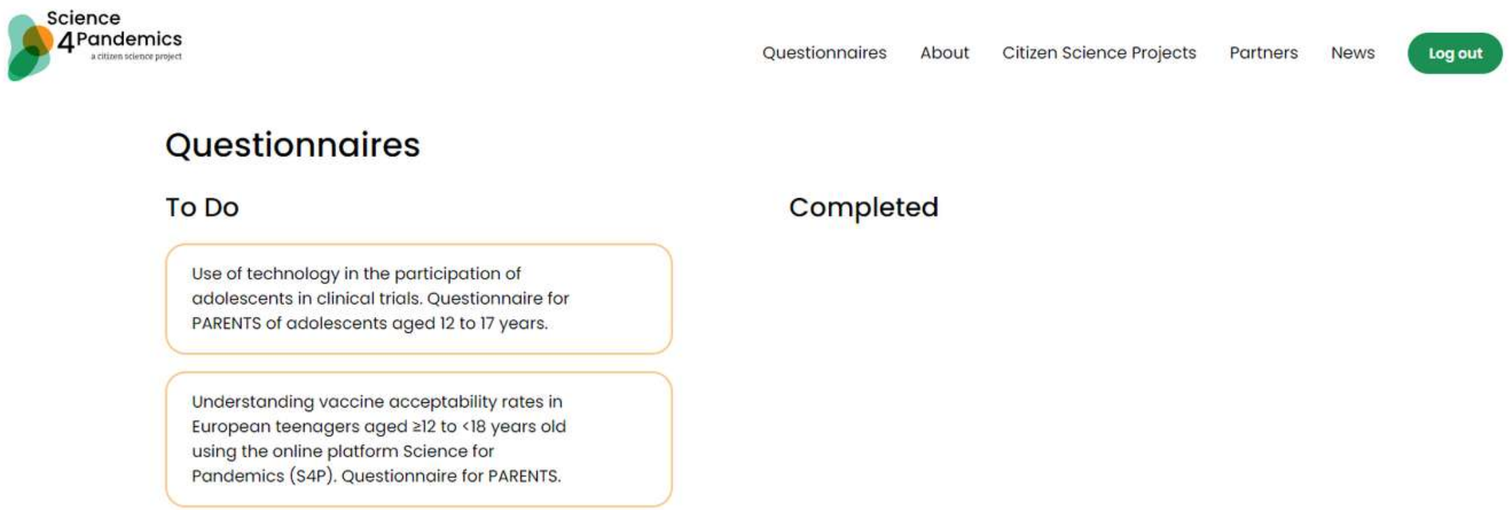
Session 1

DESCRIPTION - PHASE 2

In the second phase, the students will answer the **questionnaire about vaccine hesitancy**. For answering the questionnaire, the students will have to log in to the Science4Pandemics platform.

It is imperative the students do not have any type of information about the content of the activity so as not to condition or contaminate the answers.



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Session 1

DESCRIPTION - PHASE 3

After answering the questionnaire, the teacher will encourage students to **play the Science4Pandemics game at home** within the next week, informing them that they will be testers of the game. In order to do so, they will have to log in to the Science4Pandemics platform again.

It is important not to force teenagers but instead guide them to making the action of playing the game seems an attractive idea.

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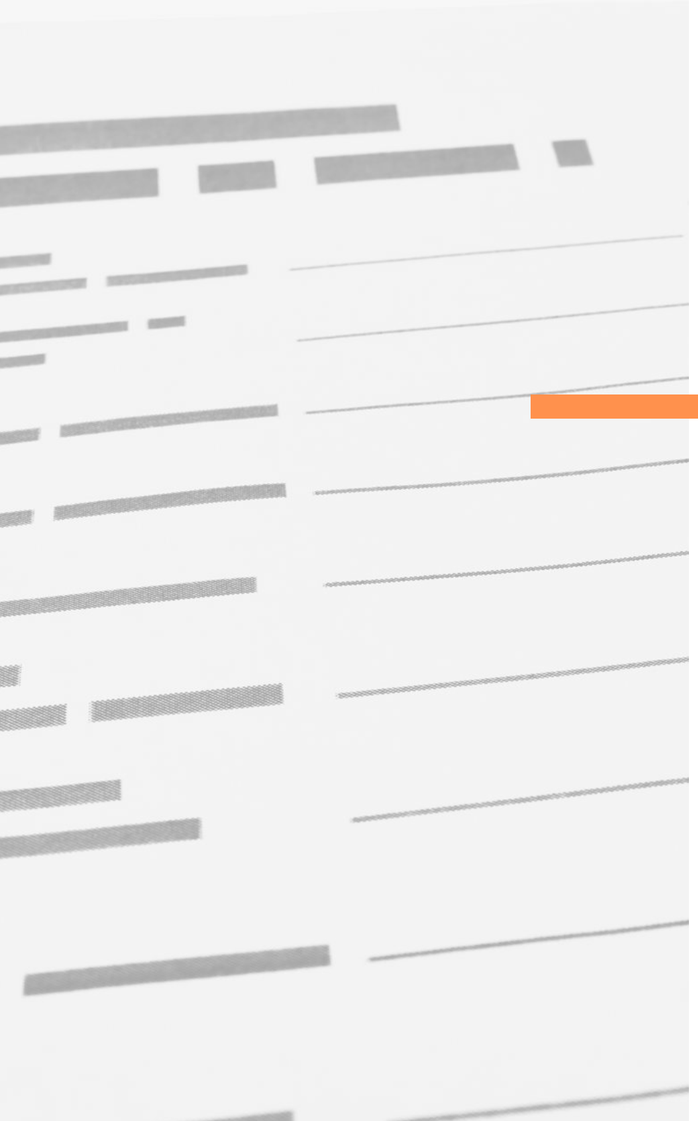

Session 2

QUESTIONNAIRE

Answering the questionnaire about vaccine hesitancy after having played the game.

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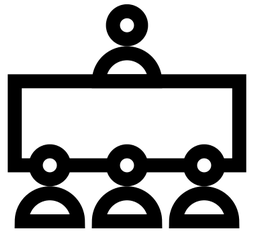
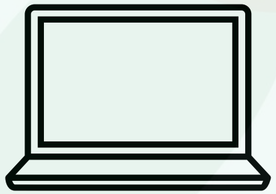
Session 2

GENERAL INFORMATION

Duration: 15 minutes.



Session 2 will be carried out 1 week after session 1. The students that have been playing the game at home will answer the questionnaire on their own.
Hence, this session is not mandatory for all the students, but it is recommended to be developed at least by the half of them.



The students will need a device (laptop, tablet, mobile phone).

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Session 2

DESCRIPTION

Phase	Recommended duration	Session 2: Answering the questionnaire about vaccine hesitancy after having played the game.
1	15'	**Answering the questionnaire about vaccine hesitancy after having played the game.**

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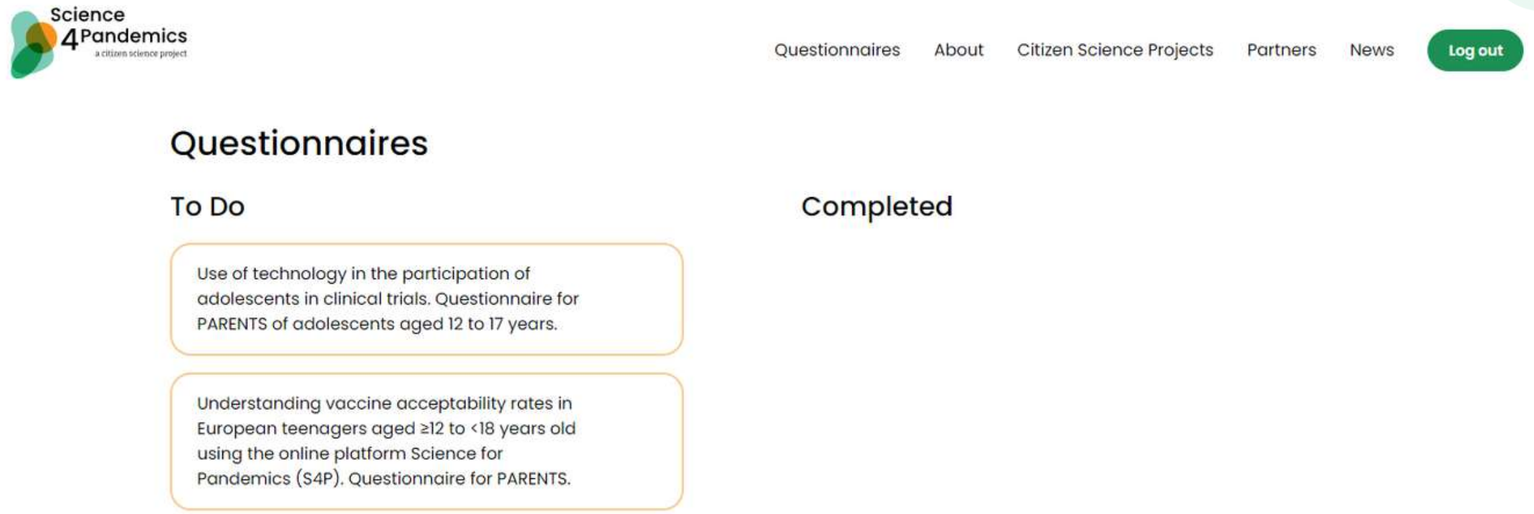
Session 2

DESCRIPTION - PHASE 1

In the second session, the students that have been playing the game will **individually answer the same questionnaire of vaccine hesitancy again**. To do that action, they will have to log in to the Science4Pandemics platform, the same as in the previous session.



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Session 3

DIGITAL TECHNOLOGIES

Developing a citizen science activity related to assessing preferences for the use of digital technologies in clinical trial participation in children aged from 12 to 17 years old.

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Session 3

PRESENTATION

Clinical trials are a key step in the discovery of new drugs and treatments and are of great help to advance medicine. However, recruitment and retention of patients, especially children, appears to be one of the main challenges that scientists face.

In order to make the most of clinical trials and see that technology is impacting all the dimensions of our life and medical research after the COVID-19 pandemic is moving to the digitalization of some activities, we have created a questionnaire for teenagers aged 12-17 and their parents that aims to identify preferences for the use of digital technologies in clinical trial participation among young people.

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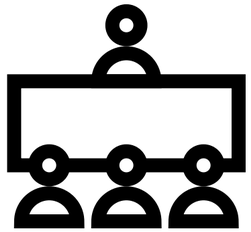
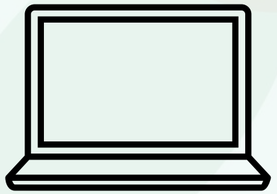
Session 3

GENERAL INFORMATION

Duration: 20 minutes.



The students will carry out the questionnaire on their own.



The students will need a device (laptop, tablet, mobile phone).

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Session 3

DESCRIPTION

Phase	Recommended duration	Session 3: Developing a citizen science activity related to assessing preferences for the use of digital technologies in clinical trial participation in children aged from 12 to 17 years old.
1	3'	**Introducing clinical trials though a short video.**
2	15'	**Answering the questionnaire to assess preferences for the use of digital technologies in clinical trial participation.**

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Session 3

DESCRIPTION - PHASE 1

At the beginning of the session, before answering the questionnaire about the digitization of clinical trials, the students will **watch a short video explaining what a clinical trial** is to increase their knowledge about that concept.

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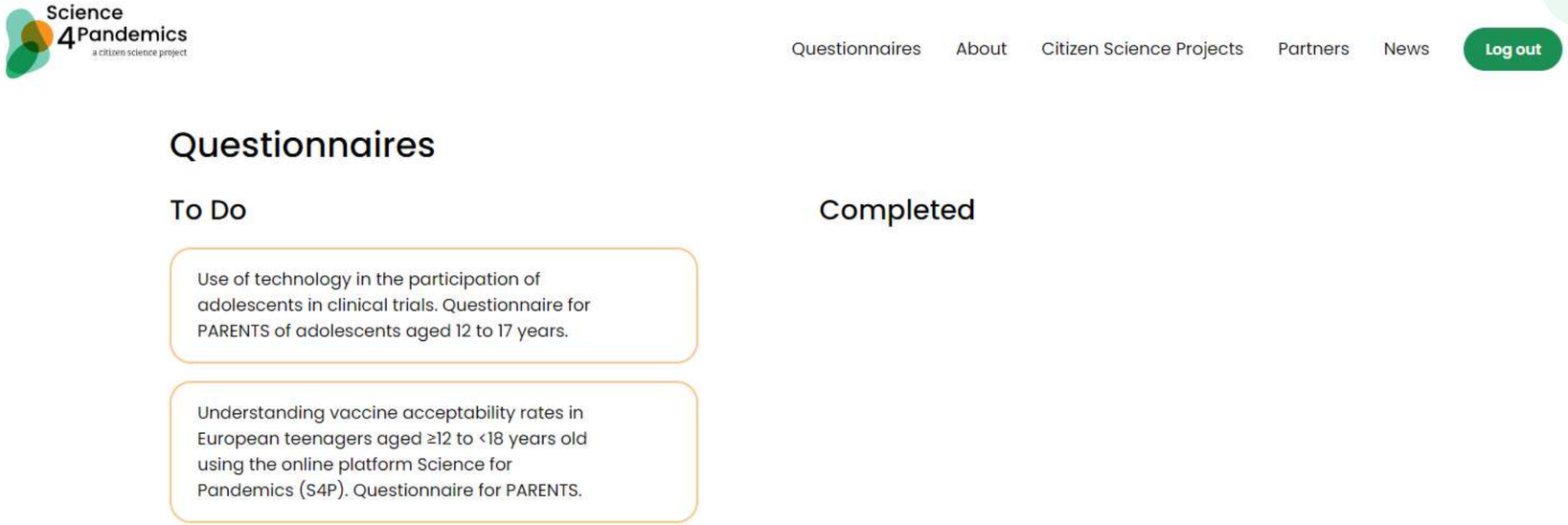
Session 3

DESCRIPTION - PHASE 2

In the second phase, after watching the video, the students will **answer the questionnaire about the digitization of clinical trials**.



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Session 4

CITIZEN SCIENCE

Learning about citizen science.

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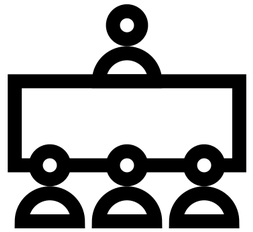
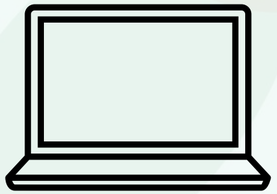
Session 4

GENERAL INFORMATION

Duration: 90 minutes.



The activity proposed will be developed in groups of a maximum of 4 to 6 students.



The students will need a device (laptop or tablet).

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Session 4

DESCRIPTION

Phase	Recommended duration	Session 4: Learning about citizen science
1	5'	**Presentation of the activity to develop by the teacher.**
2	15'	**Discussion in groups without any prior knowledge and informational resources.**
3	40' - 45'	**Design a concept map consulting the support material provided by the teacher.**
4	30'	**- Discussion on the answers and the information summarized with all the groups. - Discussion on the relationship between the activities carried out in the previous sessions and citizen science. - Involving parents in the Science4Pandemics citizen science activities.**

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Session 4

DESCRIPTION - PHASE 1

Description of the activity that should be developed by the students without giving specific information about the core concepts of citizen science.

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Session 4

DESCRIPTION - PHASE 2

After learning the activities that must be carried out, the students will **discuss in groups of 4 to 6 the core concepts of citizen science** without any prior knowledge and resources for a maximum of 15 minutes. The teacher will adopt a dynamic role within each working group.

It is important to ensure the groups are heterogeneous in terms of learning abilities in order to encourage the compensation and balance of inequalities and to promote attention to diversity.

To address the activity, it is indispensable to hand out to each group a short script with the key questions that are recommended to be discussed (without the answers). **The answers given are for the teacher.**

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Session 4

DESCRIPTION - PHASE 2 - SCRIPT FOR THE STUDENTS

1. What is citizen science? If you have never heard about this concept before, what does it suggest to you? What these two words together could mean?
2. What could be the aims of citizen science?
3. What are the forms of research involving citizen science? (Reflect on the relationship between the scientific method and research involving citizen science). Where do you think citizens can participate in a research project? At which stage of the process?
4. Do you know of any citizen science projects? If so, describe them. If you don't know any, which project could you imagine?
5. What do you think you can learn by being a part of a citizen science project?

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Session 4

DESCRIPTION - PHASE 2 - ANSWERS (1)

1. Citizen science is a practice in which citizens are an active part of research (research in sciences, social sciences or humanities and arts), turning into citizen scientists. Thus, in citizen science, scientist researchers and citizens transform research into a collaborative activity.
2. Citizen science aims to include society in the research results, making them an important part of the research process. By doing so, scientific education is also being promoted within society.

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Session 4

DESCRIPTION - PHASE 2 - ANSWERS (2)

3. Citizen scientists can participate in multiple stages of the scientific process:

- Developing the research question.
- Designing the method.
- Gathering and analysing data to support or refute a hypothesis.
- Communicating the results.

There are different levels of citizen science:

- Citizens as providers of data.
- Citizens involved in the improvement of a project.
- Citizens participating in a problem definition and data collection.
- Citizens collaborating in science: problem definition, data collection and analysis.

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DESCRIPTION - PHASE 2 - ANSWERS (3)

4. Discover some projects: https://eu-citizen.science/projects

5. Getting involved in research is a great opportunity to increase knowledge in this field, understand the work that researchers do and be part of it.
This practice is a benefit both to the researcher and to the citizen scientist. Through their contributions, the citizen scientist can be actively a part of a research community.
For more information about citizen science, it's recommended to consult the documents that are in the resources of the European Citizen Science Association (ECSA): https://ecsa.citizen-science.net/ecsa-guidelines-and-policies/

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Session 4

DESCRIPTION - PHASE 3 (1)

After the students have answered all the questions raised, **the teacher will provide them with the support material**. After reading all the materials, they will have to **design a concept map** that includes all the core concepts about citizen science following the script that has been given at the beginning of the session.They must incorporate an example of a real citizen project.

Support material (Informational resources about citizen science):

- European Citizen Science Association (ECSA) Characteristics of citizen science: https://ecsa.citizen-science.net/ecsa-guidelines-and-policies/
- ECSA 10 Principles of citizen science: https://ecsa.citizen-science.net/ecsa-guidelines-and-policies/
- Examples of citizen science projects: https://eu-citizen.science/projects

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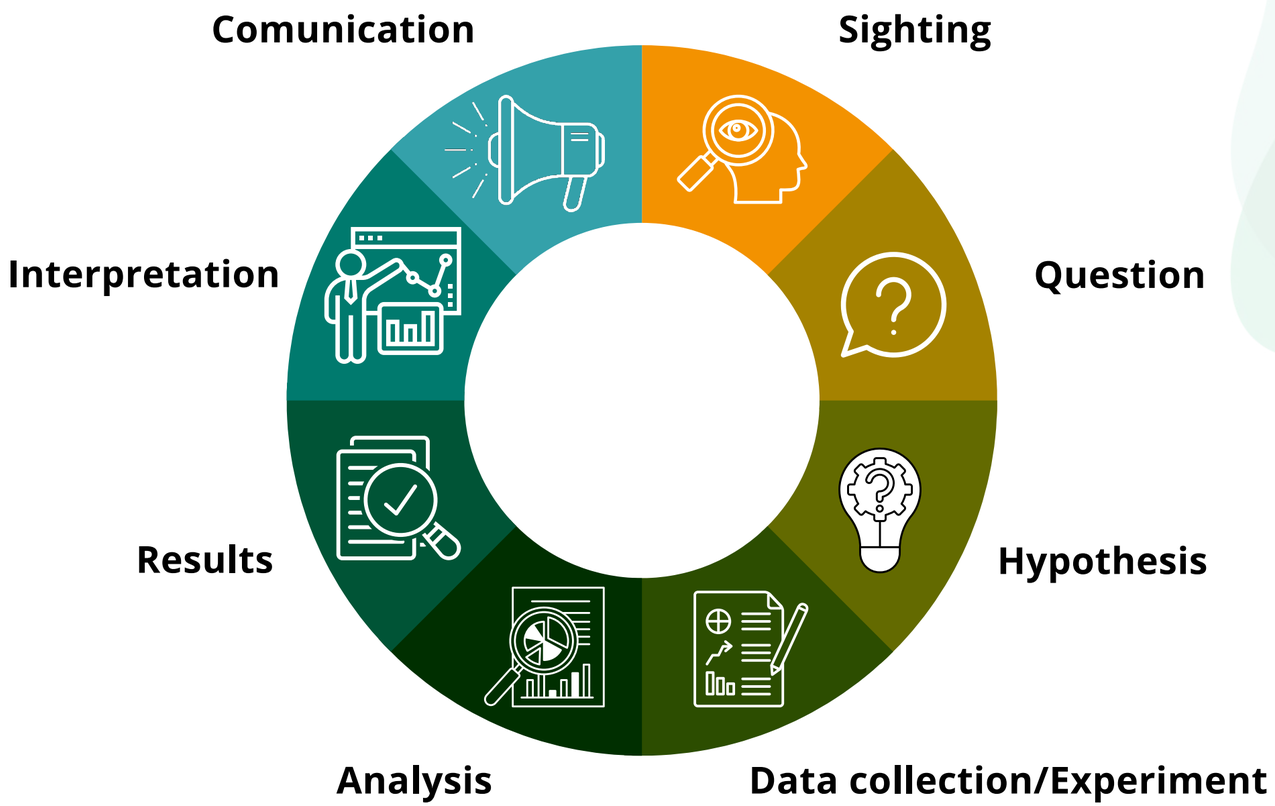
DESCRIPTION - PHASE 3 (2)

- Infographic about the scientific method



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Session 4

DESCRIPTION - PHASE 4 (1)

Finally, **the students will come together to discuss the answers and the information summarized** by all the groups. After the discussion, they will **reflect on the importance of citizen science**, what they can learn being a part of a real citizen science project, why their involvement is imperative and **the relationship between the activities carried out in the previous sessions and citizen science**.

The teacher will guide them to the following reflection: Answering the questionnaires, the students have been providers of data. By doing so, they have been promoting collaborative research. In addition, by playing the game, they have been educated for preparedness and an enhanced understanding of the prevention and management of future pandemics.

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Session 4

DESCRIPTION - PHASE 4 (2)

Afterwards, the teacher will instruct students to **involve their parents by talking at home about the importance of citizen science**, culminating with parents answering the questionnaires about vaccine hesitancy and digitization of clinical trials.

The teacher will remind the students that before answering the questionnaire, their parents should have finished the registration process on the Science4Pandemics platform. Therefore, to answer the questionnaires parents will have to follow the same process as them.

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TEACHING GUIDE

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Thank you!