

Can Microbiology empower Rural Students and foster their scientific curiosity?

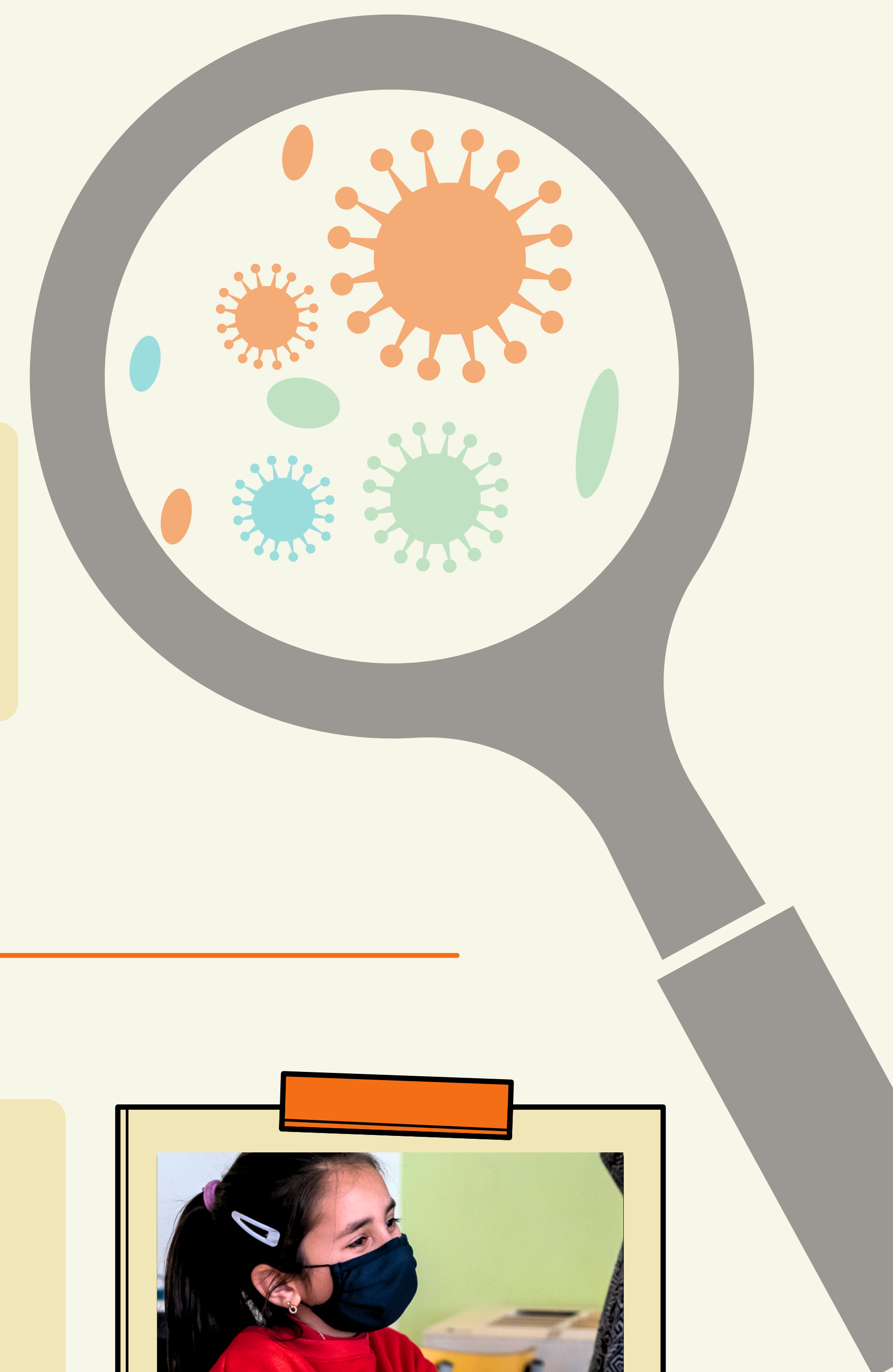
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Background

Education as a pillar of sustainable development:

According to UNESCO, 258.4 million children, adolescents, and young adults lack access to school, and 12 million children of primary school age have never attended school and will probably never go.

There is an **urgent need** for a comprehensive approach to address global challenges, with education for all being pivotal in this endeavor.

Persistent disparities in rural education:

Rural areas, covering 75% of the European Union, continue to face educational disparities, hindering youngsters' access to effective learning and limiting their potential.

Portugal exemplifies these challenges, ranking among the countries with the most significant social inequality in Europe (21.8% of Portuguese children live in poverty and social exclusion.)

Armamar, a village situated in Portugal's interior, with unique socio-economic and geographical factors, is no exception.

The significance of Microbiology in Science Literacy:

As an interdisciplinary discipline, microbiology holds the potential to empower young students and offer a gateway to a broader world of scientific discovery. Particularly relevant in the wake of events like the COVID-19 pandemic, understanding microbiology is crucial.

Initiatives such as **GOMA (Gomes Teixeira Science Academy)**, established to enhance scientific literacy in rural areas like Armamar, exemplify efforts to address these challenges by promoting initiatives like **"The Invisible Life of Bacteria" for primary school students**.

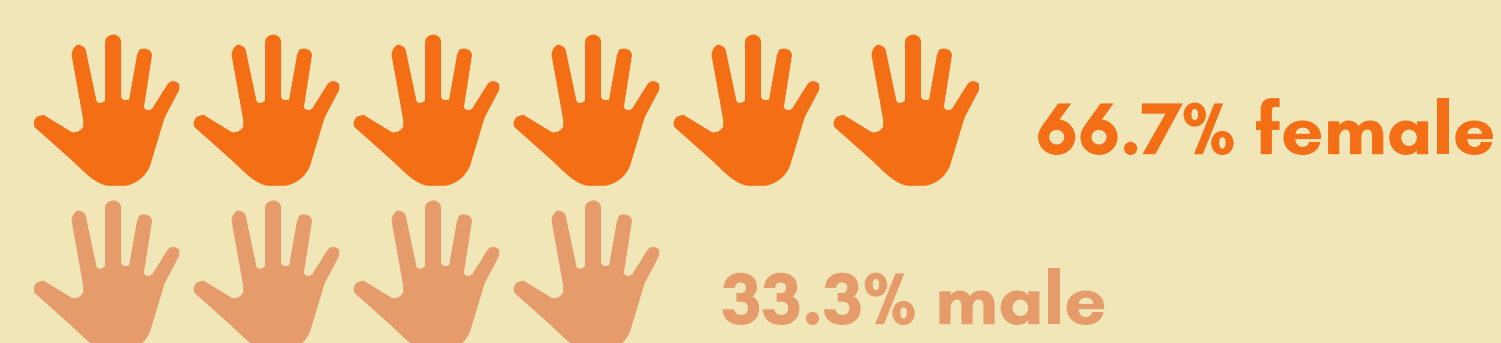
Main Findings

Aligned with United Nations Sustainable Development Goals:



21/22 and 22/23: $n_{\text{Total}} = 4$ "The Invisible Life of Bacteria" sessions

$n_{\text{Total}} = 60$ fourth-grade students (aged 9-10)



Students perception of scientists and diversity in science:

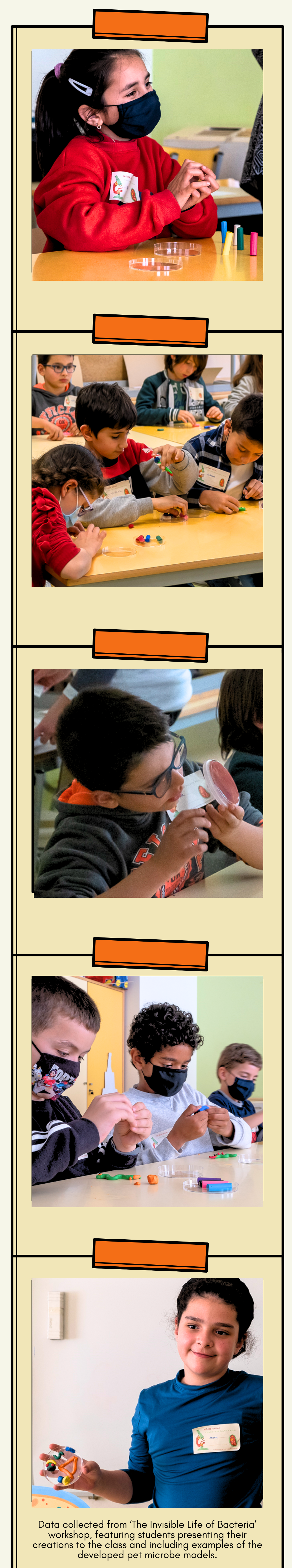
Students demonstrated recognition of prominent scientists like Albert Einstein and Gomes Teixeira, but showed gaps in knowledge regarding figures such as Marie Curie and other scientists from diverse backgrounds.

While 70% expressed reservations about accessibility to science careers, 20% maintained a positive outlook, highlighting the need to address barriers and promote inclusivity in STEM education.

Insights from the 'Imagine Your Microbe Pet' initiative

'The 'Imagine Your Microbe Pet' activity successfully enhanced elementary students' understanding of basic microbiology concepts.

Moreover, all students effectively communicated their 'science message,' exhibiting adaptability, inclusivity, and communication competencies.



Methods

Branquinho et al. (2024). doi: 10.21125/inted.2024

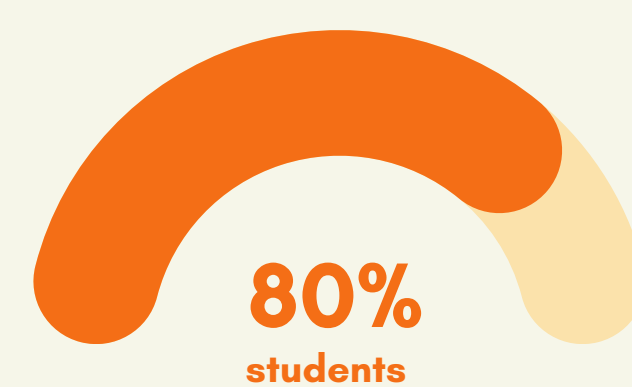
Take-Home Message

! The 'Invisible Life of Bacteria' workshop is a transformative initiative that challenges primary school students through microbiology.

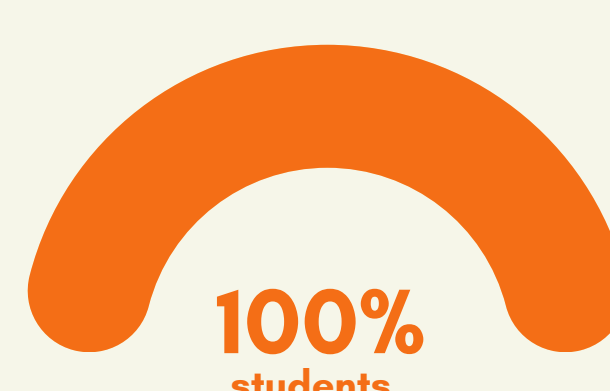
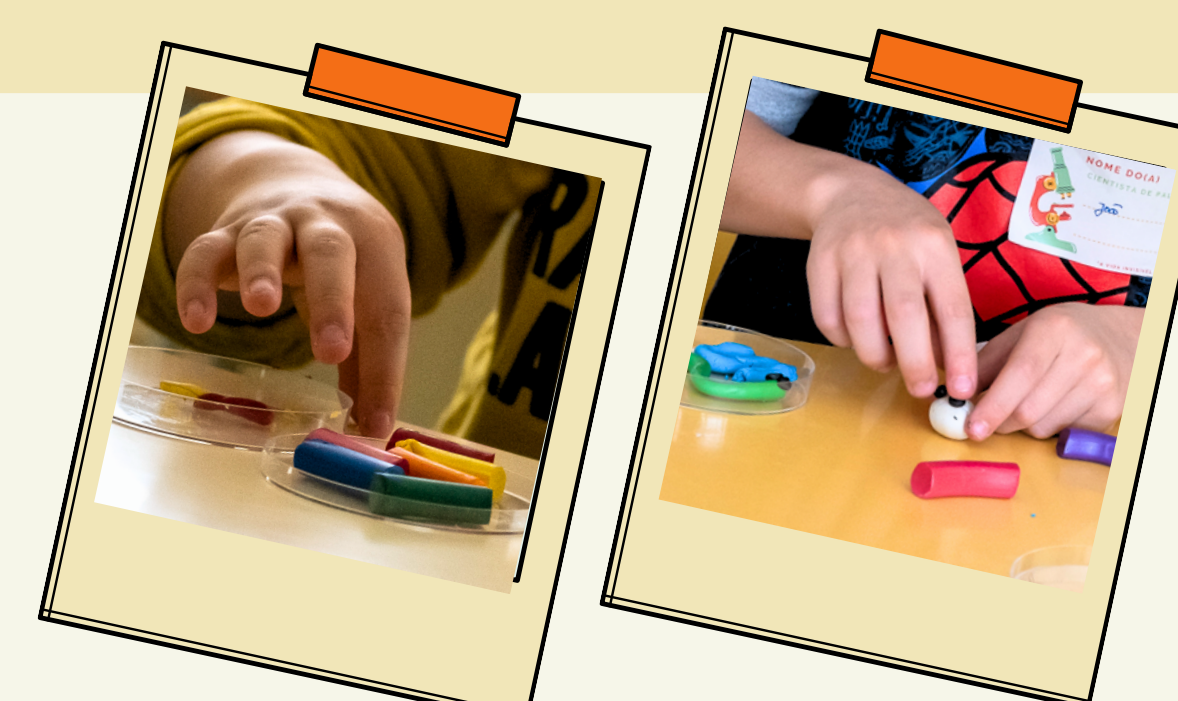
! Results from the initiative revealed that the activities sparked curiosity, challenged stereotypes, empowered students, and fostered a deeper understanding of microbiology in this underserved community.

! While promising, further research is needed to understand the long-term effects of the initiative.

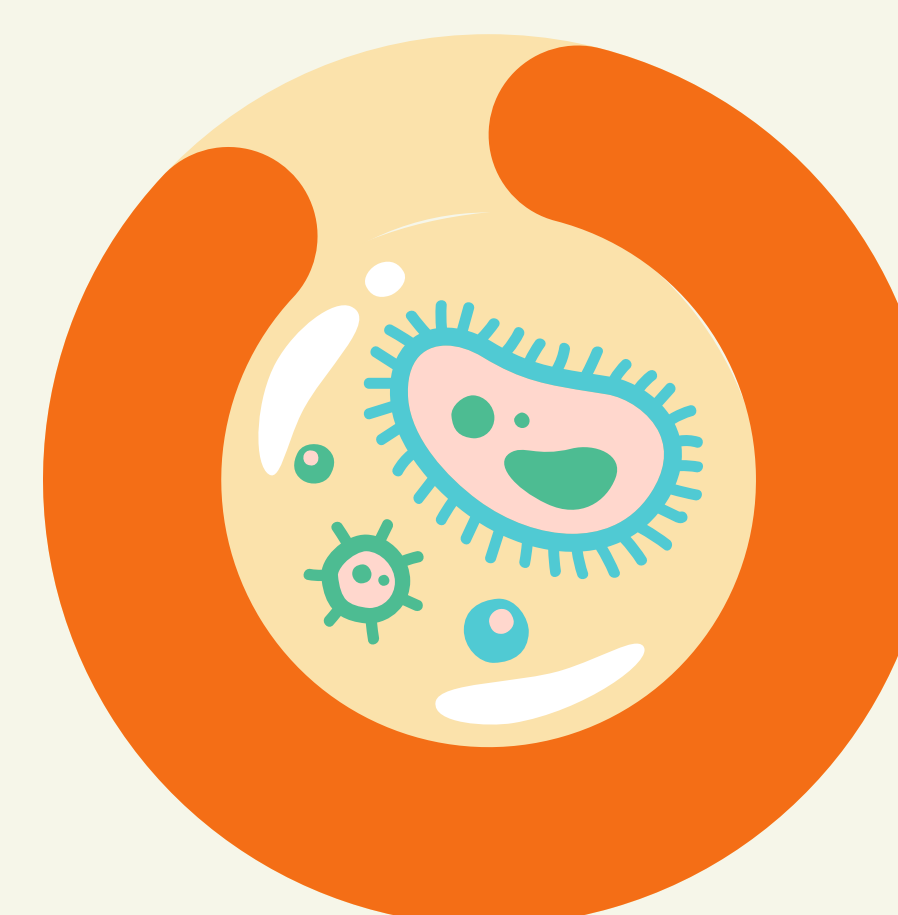
! Ultimately, this initiative lays the groundwork for a more inclusive, scientifically literate future where every child has the opportunity to explore, learn, and thrive.



Experienced their first interaction with a scientist



Expressed positive sentiments in the aspect of meeting a scientist



91% defined as **spectacular**
7.4% defined as **fun**

Check out our video:



! Find out more by reading the **entire article** doi: **10.21125/inted.2024**

Data collected from 'The Invisible Life of Bacteria' workshop, featuring students presenting their creations to the class and including examples of the developed pet microbe models.