



University of Dundee

"Hidden Life on Your Hands"

Stanley-Wall, Nicola; Carneiro, Joana

DOI:
[10.20933/100001265](https://doi.org/10.20933/100001265)

Publication date:
2022

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):
Stanley-Wall, N., & Carneiro, J. (2022). "Hidden Life on Your Hands": Teacher's Guide. University of Dundee.
<https://doi.org/10.20933/100001265>

General rights

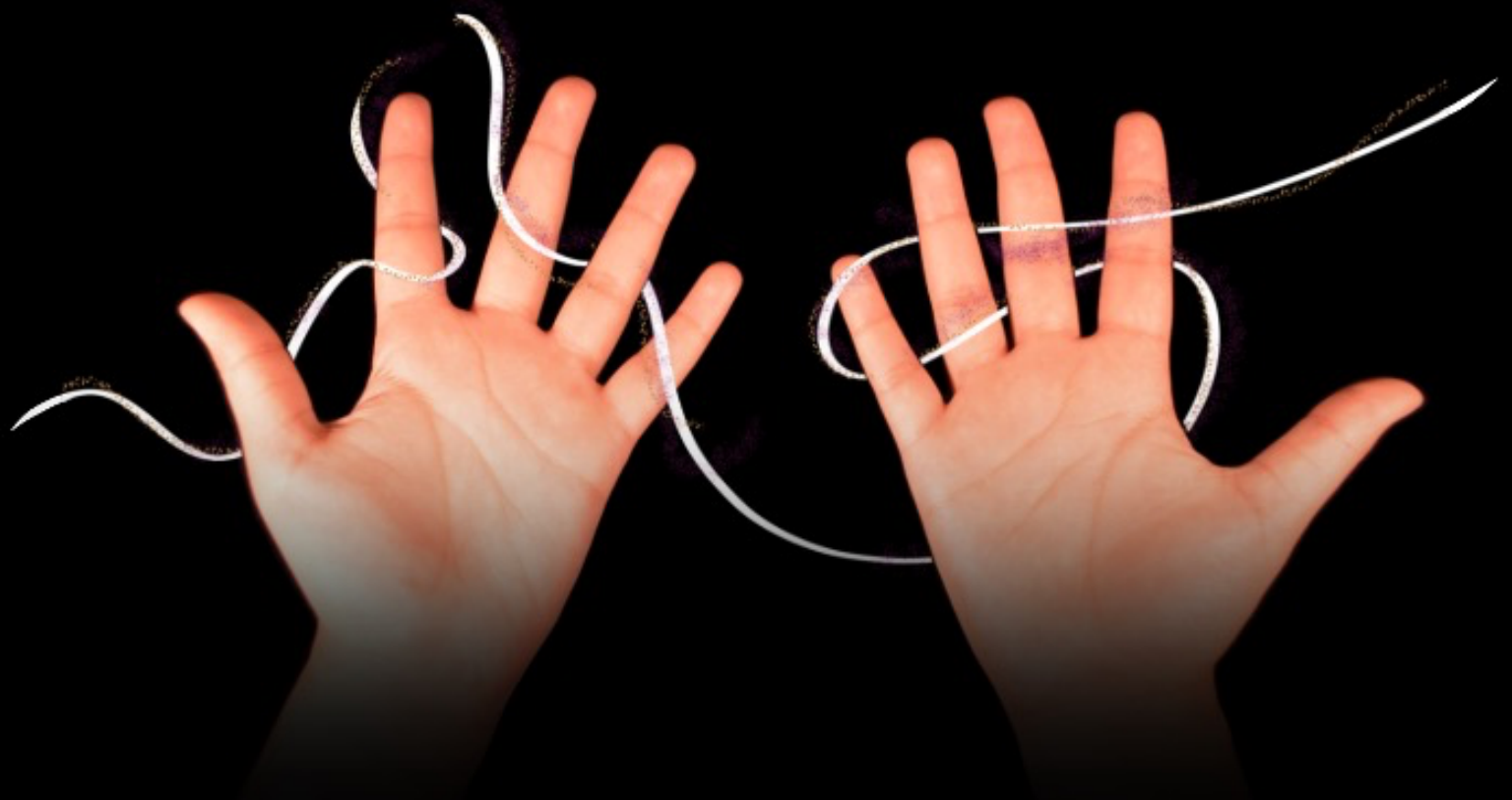
Copyright and moral rights for the publications made accessible in Discovery Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from Discovery Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

“Hidden Life on your Hands”: Teachers’ Guide



UK Research
and Innovation



National Biofilms
Innovation Centre



School of Life Sciences
University of Dundee



OVERVIEW

The “**Hidden Life on your Hands**” video was created by the Stanley-Wall laboratory based in the Division of Molecular Microbiology at the University of Dundee. It was the result of a public engagement activity with schoolchildren aged 11 and 12. In the activity, children with washed and unwashed, or hands sanitised with alcohol gel, were asked to make handprints on agar. Agar is a jelly-like substance that allows microbes to grow. After storage of the agar plates at body temperature over two days, the microbes present on the children’s hands grew on the agar plates.

The accompanying video introduces children to basic concepts of microbiology and highlights the diversity of microbial life present on our hands normally invisible to the naked eye. Additionally, the video stresses the importance of maintaining a good hygiene by washing our hands regularly.

This video can be used by teachers to help visualise the complexity of microorganisms found on our hands and cover aspects of microbiology such as:

- Where microorganisms can be found in our daily lives and how they come in contact with our hands
- How some microorganisms can be grown on agar plates and can grow to an amount that can be seen with the naked eye
- The difference (or lack of difference!) in microbes present on washed and unwashed hands, and hands sanitised with alcohol gel
- What bacteria and fungi look like when grown on agar plates
- Some bacterial behaviours we can observe (including spreading, biofilm formation, pigment production, and competitive interactions)

Contents in this video directly or indirectly relate to the following sections of the “**Curriculum for Excellence**”:

- **HWB 0-33a / HWB 1-33a** (Safe and hygienic practices): I am becoming aware of how cleanliness, hygiene and safety can affect health and wellbeing and I apply this knowledge in my everyday routines such as taking care of my teeth.
- **HWB 2-33a** (Safe and hygienic practices): Having learned about cleanliness, hygiene and safety, I can apply these principles to my everyday routines, understanding their importance to health and wellbeing.

- **SCN 1-13a** (Body systems and cells): I know the symptoms of some common diseases caused by germs. I can explain how they are spread and discuss how some methods of preventing and treating disease benefit society.
- **SCN 3-13b** (Body systems and cells): I have contributed to investigations into the different types of microorganisms and can explain how their growth can be controlled

YouTube URL (with captions available): <https://youtu.be/CVaAX3Owt3A>

TRANSCRIPT

“Our hands are covered with microbes that are so small we can’t see them with the naked eye. However, they’re all around us – at home, in school, in the transports we take, in the animals we pet, in the things we touch and the activities we do.

We asked children to make handprints on agar, a jelly which allows microbes to grow, with washed, unwashed, and sanitised hands. The microbes on your hand are passed to the jelly, which is put at a warm and comfortable temperature for the microbes to grow. Over time, the microbes make more copies of themselves and create large communities.

These are the plates with the handprints from unwashed hands. You can tell some people had their hands quite clean as not many microbes grew on the plates, while other people had their hands covered with all different types of microbes. Some children didn’t wash their hands very well and the plates were full of microbes, while other children did quite a good job at washing their hands. Lastly, using hand sanitiser didn’t appear to work very well in killing the microbes, except for a few children whose hands were very clean.

If you look closely at the plates, there are many interesting things you can find. Most plates had bacteria growing, while a few plates had fungi on them, a different type of microbe that can look fluffy. Bacteria can travel long distances in a process called

'spreading'. However, not all bacteria can do this. Another interesting thing bacteria can do is create structures called 'biofilms', social communities for them to live in. Not all bacteria are the same colour, some make pigments. And when bacteria don't like each other, they can make weapons which kill the other bacteria surrounding them.

Lastly, some people only had one or two types of bacteria grow on the agar plates from their handprints, while others had many different types growing, which can be seen by the different shapes and colours on this plate.

As you can see, there's a vast range of microbial life hidden on your hands. Some microbes keep you healthy, while others can make you sick. Therefore, it's important to wash your hands regularly to make sure you stay well.

Thank you to the children who participated in this project!"

ACKNOWLEDGEMENTS/CREDITS

Work in the NSW laboratory is funded by the Biotechnology and Biological Science Research Council (BBSRC) [BB/P001335/1, BB/R012415/1].

The video and associated guide were created by Joana Carneiro under the supervision of Prof Nicola Stanley-Wall.