



# Microplastics - Teacher manual

Digital Guest Lectures



Universiteit  
Leiden  
ICLON

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## Introduction

Science and research can be viewed from multiple perspectives. An archeologist can research music, and stress can be researched from both a biological and pedagogical perspective. To demonstrate these multiple perspectives and aspects of research, this Digital Guest Lecture has been developed within a series of Digital Guest Lectures on various topics<sup>1</sup>.

The Digital Guest Lectures are developed by the Leiden University Graduate School of Teaching (ICLON) in collaboration with the Centre for Innovation (CFI).

### **Structure of the Digital Guest Lecture**

A Digital Guest Lecture consists of one video of about 10 minutes. In this video two researchers discuss a topic from their own (different) perspective and ask provocative questions. In this teacher manual you can find a recommended lesson plan with interactive activities to discuss these questions with the students.

Each Digital Guest Lecture can fill one lesson hour of 50 minutes. However, we included some alternative assignments or extensions to some of the suggested assignments in this manual if you would like to spend more time on this subject.

Please feel free to change the assignments and/or deviate from the recommended lesson plan to make this Digital Guest Lecture suitable for your own teaching context. Do you have any questions, comments, or suggestions? Please contact us by sending an email to [digitalegastles@iclon.leidenuniv.nl](mailto:digitalegastles@iclon.leidenuniv.nl).

## **COLOFON**

### **This digital guest lecture is developed by:**

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### **Images:**

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<sup>1</sup> Visit our website to find more Digital Guestlectures: [www.universiteitleiden.nl/digitalegastlessen](http://www.universiteitleiden.nl/digitalegastlessen)

## Learning outcomes

At the end of this Digital Guest Lecture, students can:

1. Describe the problem of microplastics for the environment and human health
2. Explain how microplastics get in human bodies.
3. Propose solutions and policies to prevent, mitigate, and clean up microplastics.

## Prior knowledge

To get the most out of this Digital Guest Lecture, students are expected to be able to:

- Explain in broad terms why using plastics is a concern for the environment
- Distinguish between the roles and responsibilities of different regulating organizations such as the Dutch government, the European Union, and the United Nations.

## Lesson material

### Preparation

We advise you to do these things in advance:

1. Watch the total video (at least) once.
2. Read the assignments, make a choice and/ or think of alternative assignments fitting your context and students.
3. Have the passcode for the video at hand when you start your lesson.
4. Make sure to have the necessary materials for each assignment available (if applicable)

### Lesson plan

Time	Content
Before class	Assignment 0.1
0-5 minutes	Getting ready, setting up the video and introduce the Digital Guest Lecture.
	Assignment 0.2 (optional)
5-8 minutes	Video part 1
8-15 minutes	Assignment 1 (pause the video between 2:22 and 2:34)
15-20 minutes	Video part 2
20-35 minutes	Assignment 2 (pause the video between 6:23 and 6:34)
35-40 minutes	Video part 3
40-50 minutes	Assignment 3 (end of the video)

## Assignment 0.1 (before the start)

### **Materials**

Cosmetic and personal care products  
The Microbead app from the Plastic Soup Foundation

### **Assignment**

Let students bring their own cosmetic product to class. For example, their shower gel, hair gel, shampoo, or make-up. You can also provide some additional products to make sure that every student has a product in their possession. It's also recommended to download the Microbead app from the Plastic Soup Foundation in advance so that students can use it in-class.

### **Feedback**

This assignment will be followed up on in assignment 1.

## Assignment 0.2 (optional – at the start)

### **Materials**

None

### **Assignment**

Do students think that they have (micro)plastics in their bodies? Do a quick poll in-class where students can raise their hands if they think that they have microplastics in their bodies.

### **Feedback**

You can have a follow-up discussion to inquire why students do or do not think that there are plastics in their bodies. The answer of microplastics in the human body will also soon be answered in the introduction of the video (which is yes, we know that they go into the intestines).

## Assignment 1

### **Materials**

Brought cosmetic and personal care products  
The Microbead app<sup>2</sup>

### **Assignment**

Are the products that students' have brought containing microplastics? Let them find out. Put them in small groups and let them use the Microbead app to scan the barcode of each product. Have each group write down what microplastic or what suspicious ingredient the app reports.

### **Feedback**

Construct a list of all the found microplastics and discuss the findings of the students. Was it what they expected? What products didn't contain microplastics? Would it have been possible to identify the microplastics without the app?

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<sup>2</sup> Or visit the website: <https://www.beatthemicrobead.org/product-lists/>

## Assignment 1.2 (optional)

### Materials

None

### Assignment

In the video Fazel raises the question why the government and authorities do not stop the companies from using microplastics in the products. Who should be responsible for regulating the use of microplastics? Let the students prioritize the following possible regulators and make a list of the least responsible at the bottom of the list, and at the top of the list who is most responsible according to them.

- Cosmetic companies
- Shops selling cosmetics
- European Union
- Water companies
- National government
- United Nations

### Feedback

Briefly discuss the 'responsible' list. Some of the following questions may guide the discussion.

- What authority do these possible regulators have regarding microplastics?
- What could they do to minimize the use or emission of microplastics?
- Should they be responsible for regulating microplastics? Why or why not?

In the next part of the video Fazel will explain that the EU is already doing something but that microplastics is a global problem and that action on a larger scale is necessary.

## Assignment 2

### Materials

None

### Assignment

Let students think about the questions in the video for a minute, it may help them formulate some search terms to find answers on the internet:

- What kind of data do they think is necessary for regulation (i.e., what information would probably convince the government to act)?
- What kind of researchers would be necessary to collect these data (i.e., from what field of research and what type of research would they do)?

Have students pair up and use their phones or computers to search the internet for answers to the questions.

### Feedback

Let students share the answers they have found. In the following section of the video, Esther will highlight that monitoring pollution is one type of data that is already used.

## Assignment 3

### Materials

None

### Assignment

At the end of the video Esther and Fazel challenge the students to write a (research) proposal dealing with microplastic pollution. Split the students up in smaller groups to brainstorm ideas for preventing, mitigating, or cleaning up microplastics. They can look at existing examples for inspiration, for example the Beat the Microbead-app, Fionn Ferreira's tool to remove microplastics from water, or existing laws on (micro)plastics.

After the initial brainstorm, you can bring more focus by asking students to include the following in their proposal:

- What aspect of microplastics do they want to tackle (prevention, mitigation, or cleaning up)
- Their idea
- The target group of the proposal (e.g., companies, government, consumers)
- The main disciplines involved (e.g., law, biology, technology, sociology)
- A feasibility analysis of the proposal (including an estimation of the time, materials and other resources needed to execute the proposal)

### Feedback

Depending on the format of your choice, the groups can pitch their ideas and choose the best proposal or hand in their written proposals for review.

See also these websites and video of the Plastic Soup Foundation:

- <https://youtu.be/St4kd7xsehI>
- <https://www.plasticsoupfoundation.org/en/>
- <https://www.plasticsoupfoundation.org/wat-wij-doen/educatie/plasticsoep-lesmateriaal-voortgezet-onderwijs/profielwerkstuk-plasticsoep/> (in Dutch)
- <https://www.plasticsoupfoundation.org/wat-wij-doen/educatie/plasticsoep-lesmateriaal-voortgezet-onderwijs/> (in Dutch)