Scientific Paper Digest - About this Resource

This resource focuses on:

- Using the scientific method to study or verify an observation
- Introduction to microplastics
- Perception of the public towards plastics/microplastics
- Exploring visualization of research data

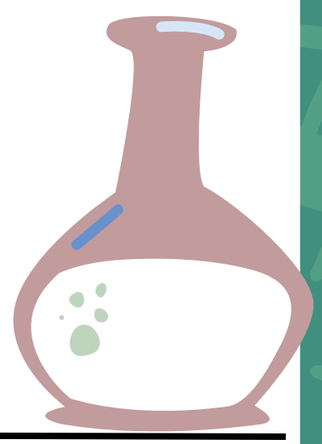
Subject	Strand
Science	The Scientific Method
Geography	Environmental Awareness
C.S.P.E.	Social Responsibility

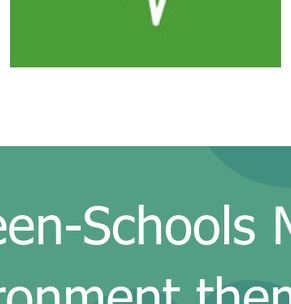
Skills:
Comprehension Skills, Scientific Method, Analysis of Qualitative Research, Result Interpretation

Learning Objectives:
Familiarise students with the scientific method. Explore the parts of a research project and explore how scientists developed their hypothesis. Develop an understanding what are the barriers for citizens to take action.

This Resource Includes:
Steps of the scientific method.
A popular science summary for non-scientists of the research paper.

Glossary of terms
Questions on the paper to further explore understanding of the topic.





Core relevance: Microplastics in oceans and marine food chains, public understanding impacts, support for marine protection policies.

Study examines how individuals interpret responsibility, behavioral change vs systematic change.

Public concern often centers on health risks of ingesting microplastics, the paper shows that uncertainty about health impacts shapes public attitudes.

Green-Schools Marine Week is an initiative of the Green-Schools Global Citizenship Marine Environment theme, and is proudly supported by the Department of Climate, Energy and the Environment.

Scientific Method

1 OBSERVE

- Observations are usually the first step in an investigation.
- They help scientists ask questions and make hypotheses e.g. Why could this be happening?
- Good observations lead to more accurate experiments.
- For example: Researchers have seen that plants only grow when exposed to light. They do not grow well in darkness.

2 DO SOME RESEARCH

During this phase, scientists read as much information as they can about the topic. This helps them understand what is already known and what scientists are still unsure about. By looking at previous research, they can find gaps in knowledge and use these to narrow down their research question and decide what new questions need to be answered.

3 FORMULATE A HYPOTHESIS

Formulating a hypothesis is a fun of asking your research question. Often, research questions are answered using a quantifiable approach, meaning you need to be able to measure what you are asking in your hypothesis. There are always 2 possible outcomes to any experiment: either the hypothesis is accepted or rejected. In our plant example, the hypothesis would be: Plants grow better when exposed to light.

4 EXPERIMENTATION

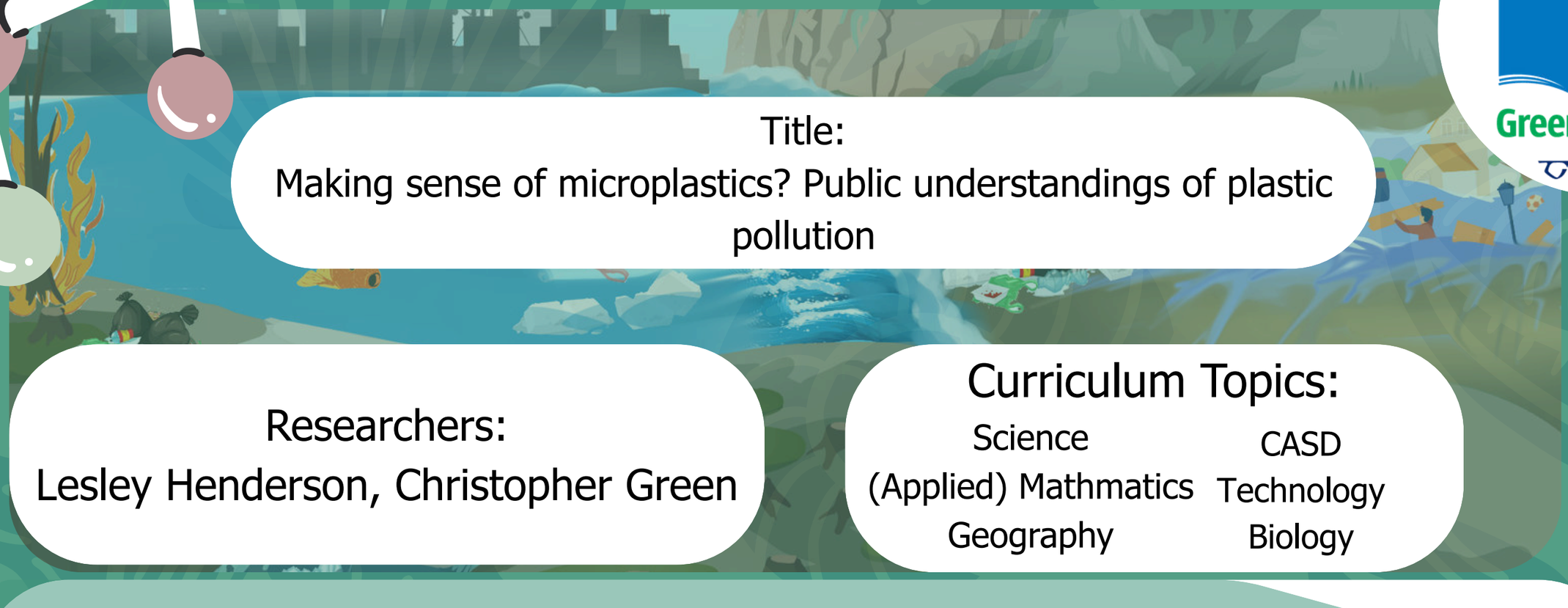
Experimentation is a key stage of the scientific method. Experiments are carefully controlled, randomised, and repeated to ensure results are accurate and free from bias. They are designed to collect reliable data by manipulating variables in order to observe outcomes. These results are then compared with existing knowledge or used to generate new scientific understanding. In the plant example, the researcher grows 3 sunflowers in darkness and 3 sunflowers in light. They would make sure that temperature and water levels are the same for all plants.

5 ANALYZING DATA

The data collected during the experimentation phase is now analysed to determine if the intervention used during the experimentation had a signification effect on the study specimen or not. In our plant case, we would measure all plants and use statistics to determine if light had a significant impact on plant growth or not.

6 COME TO A CONCLUSION

During the conclusion, researchers often put their data into perspective with other similar research. Often, researchers discuss what research should follow and how it fits within the research topic. In our plant example, researchers might suggest to run further experiments to test how different wavelengths of light impact growth or various temperatures.



Title:
Making sense of microplastics? Public understandings of plastic pollution

Researchers:
Lesley Henderson, Christopher Green

Curriculum Topics:

Science
(Applied) Mathmatics
Geography
CASD
Technology
Biology

Abstract

This paper explores how members of the public understand plastic pollution, with a particular focus on microplastics. Through group discussions with participants from different backgrounds, the researchers examined what people know about microplastics, how they make sense of the issue, and where their ideas come from.

The study found that while many people are aware of plastic pollution in general, especially large plastic waste in oceans, there is much less understanding of microplastics. Participants often relied on media images of visible plastic harm, such as wildlife affected by rubbish, but struggled to understand how tiny plastic particles are created or how they connect to everyday behaviour.

The research highlights a gap between scientific knowledge and public understanding. It suggests that improving communication about microplastics requires more than simply sharing facts — it also requires helping people connect the issue to their daily lives and experiences.

Introduction

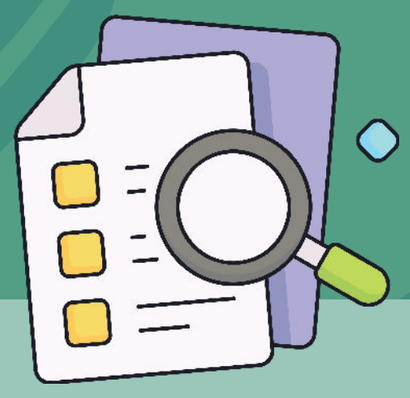
Plastic pollution has become one of the biggest environmental issues of the modern world. Over the past decade, public awareness has increased dramatically, particularly through media coverage of ocean plastics and their impact on marine wildlife. Images of seabirds feeding plastic to their chicks, turtles entangled in packaging, and beaches covered in waste have created powerful emotional responses and helped make plastic waste an environmental crisis.

However, not all forms of plastic pollution are visible. Microplastics are almost invisible, and sometimes microscopic. Microplastics are now found in oceans, rivers, soil, air, food, drinking water, and even inside the human body. Despite their widespread presence, they cannot easily be seen or touched.

This invisibility makes raising awareness challenging. Environmental problems that can be seen can be easily shown in photographs and news reports. However microplastics must be explained through scientific instruments and complex data. As a result, public understanding relies on trust in experts and news rather than personal observation (i.e. litter on the beach).

When discussing environmental issues, it is often assumed that if people do not take action, it is because they don’t understand the issue. This view suggests that once people understand an issue they will start to change their behavior and take action. However, research shows that public responses to environmental issues are shaped not only by information, but also strongly influenced by emotions, values, and trust in science.

This study explores how members of the public make sense of microplastics. Rather than measuring how much scientific knowledge people possess, it examines how they talk about microplastics, what concerns they prioritise, and how they assign responsibility for solutions. By focusing on public interpretations, the research recognises that people actively construct meaning around environmental issues that are invisible, scientifically complex, and embedded in everyday life.



Method

This study used a qualitative research design to explore how people understand and interpret microplastics in their own words. Rather than collecting numerical data, the researchers focused on discussion, conversation, and shared meaning-making.

A series of focus groups were conducted with members of the public. Participants were selected from a range of ages and backgrounds. A group setting was chosen to allow participants to respond to one another's ideas, question assumptions, and develop their thoughts collectively. This style of discussion helps researchers understand not only individual opinions but also how understandings are formed socially.

During the sessions, participants were shown prompts relating to plastic pollution, including images and short pieces of information about microplastics. These materials were used to spark discussion about:

- What participants already knew about microplastics
- Where they had found information about them
- How concerned they felt
- Who they believed should be responsible for addressing the issue

All discussions were recorded and later transcribed. The researchers then analysed the transcripts using thematic analysis. Thematic analysis involves identifying recurring patterns, key themes, and shared concerns across the different groups. Attention was also paid to moments of disagreement, uncertainty, and emotional response.

By using qualitative methods, the study hoped to capture the complexity of public understanding, recognising that attitudes toward environmental issues are shaped through conversation, interpretation, and social context rather than knowledge on a topic.

Results

Analysis of the focus group discussions revealed several recurring themes in how participants understood and responded to microplastics. These themes show both the complexity of public understanding and the emotional dimensions of environmental issues.

1. Difficulty Visualising Microplastics
A key finding was that participants struggled to clearly imagine what microplastics are. Unlike large pieces of plastic waste, microplastics were described as abstract, invisible, and difficult to conceptualise. Some participants confused them with general litter or large floating debris in the ocean. This suggests that the microscopic nature of microplastics makes them harder to understand as a concrete environmental threat.

2. Reliance on Familiar Media Narratives
When discussing microplastics, participants often referred to well-known images of marine animals harmed by plastic waste. Even when prompted about microscopic particles, discussions often returned to visible ocean litter. This indicates that media representations of plastic pollution strongly shape how newer issues such as microplastics are interpreted.

3. Uncertainty and Contamination Concerns
Participants expressed uncertainty about the scientific evidence surrounding microplastics, particularly regarding their impact on human health. The idea that plastic particles might be present in food, water, or inside the human body caused discomfort and anxiety. Microplastics were sometimes framed as a form of contamination, raising fears about long-term and unknown consequences. At the same time, many participants acknowledged that they did not fully understand the scientific details. This uncertainty did not necessarily mean a lack of concern; rather, it often increased feelings of unease.

4. Tensions Around Responsibility
Discussions revealed ongoing tension between individual and systemic responsibility. While participants recognised the importance of reducing personal plastic use, many questioned whether individual behaviour change could meaningfully address a problem produced by global industries.
Some participants showed anger at the emphasis on recycling and consumer choice, suggesting that governments and corporations should take greater responsibility for regulating production and reducing plastic use at source.

Discussion

The findings of this study suggest that public understandings of microplastics are based on more than access to scientific information. Participants did not respond with indifference or confusion alone; instead, they tried to understand the issue using familiar narratives, emotional responses, and existing knowledge about plastic pollution.

A major issue highlighted by the results is the challenge of invisibility. Since people can't see microplastics, they rely on scientific explanation and media representation. Participants frequently used images of ocean pollution to make sense of microscopic particles. This suggests that public understanding is often structured through imagery and storytelling. When a problem cannot be easily seen, it can feel strange or distant, even if it is widespread.

The discussions also demonstrates the importance of uncertainty in shaping responses to environmental risk. Participants were aware that the long-term health impacts of microplastics remain under scientific investigation. Rather than dismissing the issue, this uncertainty often generated anxiety, particularly in relation to contamination of food and water. Microplastics were sometimes framed as a hidden or internal threat, which intensified emotional reactions. This showed how modern environmental risks are often experienced through anticipation and imagination rather than direct sensory experience.

Importantly, the findings challenge the idea that public concern is limited by a simple lack of knowledge. Participants showed awareness of plastic pollution and engaged with questions of responsibility. However, they expressed frustration about the emphasis on individual behaviour change. Many questioned whether personal actions, such as recycling or reducing plastic consumption, could effectively address a global system of production and waste.

Overall, the discussion shows that responses to microplastic pollution must consider not only scientific evidence, but also how the issue is communicated, visualised, and socially interpreted. Understanding public meaning-making is essential for developing policies and communication strategies that acknowledge uncertainty, address emotional concerns, and recognise the limits of individual action.

Conclusion

This study has shown that public understandings of microplastics are shaped by invisibility, uncertainty, media representation, and debates about responsibility. Participants did not simply demonstrate a lack of knowledge; rather, they actively interpreted the issue using familiar narratives, emotional responses, and moral reasoning. Microplastics were often understood through images of visible plastic pollution, while their microscopic nature created feelings of abstraction and unease.

The findings suggest that increasing scientific information alone may not automatically lead to behavioural change. Because microplastics are complex, largely unseen, and associated with uncertain long-term effects, public engagement is influenced by trust, imagination, and perceptions of fairness in responsibility.

Recognising how people make sense of microplastics is therefore essential for developing effective communication strategies and policies. Addressing plastic pollution requires not only scientific research, but also an understanding of how environmental risks are experienced and interpreted in everyday life.

Glossary of Terms

Microplastics: Tiny plastic particles smaller than 5 mm, found in water, soil, air, and food, often from broken-down plastic or manufactured products.

Numerical Data: Information shown using numbers which can be counted or measured.

Qualitative: A type of research that focuses on opinions, experiences, and descriptions rather than numbers or measurements.

Focus group – A group discussion used by researchers to explore people's ideas, feelings, and understanding of a topic.

Public understanding of science - A field study on how non-experts interpret scientific knowledge and risk.

Risk perception - How individuals or groups interpret and emotionally respond to environmental risks.

Accumulation: Gradual build-up of something over time.

References

Henderson, L. & Green, C., 2020. Making sense of microplastics? Public understandings of plastic pollution. Marine Pollution Bulletin, 152, p.110908.
Available at: https://doi.org/10.1016/j.marpolbul.2020.110908 [Accessed 25 February 2026].

Further Reading

- Theoceancleanup.com - A non-profit organisation commited to ridding the world's oceans of plastic waste. The project is developing and scaling technologies to clean our oceans.
- Cleancoasts.org - Ireland's national program dedicated to cleaning our beaches and taking care of our oceans. Lots of fantastic information on the importance of protecting our oceans.
- Nationalgeographic.org - MarineDebris - Gives an in depth explanation of what happens to litter in our oceans, the scale of litter and how it can affect our oceans
- Oceancare.org - great website which explains microplastics and where they come from
- Torma.com - Microplastics in the ocean - Discusses methods we can reduce microplastics

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An Taisce

Q&A

Check your understanding

Name: ccccccccccc

Q1: How are microplastics produced?

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Q2: What kind of data did the study colllect?

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Q3: How did they assess public perception?

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Q4: What were the main findings from the the study?

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