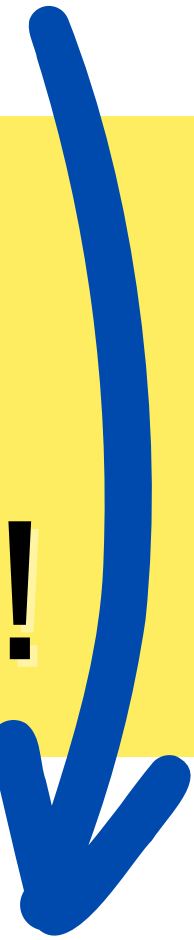


THE MICROPLASTICS MYSTERY

Gamify your students' learning with this interactive and engaging Microplastics Activity.

NO PREP

SCROLL
to take a look inside!



The Microplastics Mystery

Part 1 – Mission Briefing & Case Overview
Name: _____ Date: _____

Case File #317 – The Microplastics Mystery
Plastic was once considered one of the greatest inventions of modern society. It was cheap, strong, and convenient. But now, scientists around the world are discovering something alarming.

Tiny pieces of plastic—too small to see easily—have been found in oceans, rivers, soil, animals, and even inside the human body. These tiny pieces are called **microplastics**.

Microplastics have been detected in:

- Drinking water
- Fish and shellfish
- Table salt
- Air
- Human blood and lungs

No one is sure exactly how they are spreading so widely or what long-term damage they may cause. What is clear is that they are **everywhere**.

You are a science detective assigned to investigate this growing problem.

Your Mission

1. Identify where microplastics come from
2. Explain how they spread through the environment
3. Describe why they are dangerous

Teach With Fergy

ing, attention to detail, and strong scientific reasoning and possibly human health—may depend on what you find.

plastics?
ided by your teacher. Then answer:

erent from regular plastic trash?

3. ... find microplastics difficult to remove from the environment?



**DETECTIVE FILE ON HOW HUMANS
IMPACT THE ENVIRONMENT**

HOW THIS ACTIVITY HELPS YOU

- **Saves prep time** with a fully structured, print-and-go investigations.
- **Drives high engagement** while still meeting academic goals as students are interested in what they're doing.
- **Builds deep understanding** with real-world relevance as they analyze real evidence, make connections, and using CER to explain human impact.

10-PART INVESTIGATION

Students:

1. Step into the role of a Science Detective.
2. Examine real scientific evidence from around the world.
3. Track the hidden pathways of plastic pollution.
4. Interrogate suspects (plastic bottles, clothing, etc.) and identify the main culprits.
5. Build a scientific case using Claim-Evidence-Reasoning.
6. Propose real solutions that matter.

“★★★★★ The added images and graphs enhanced the activity. My students were engaged and motivated during the case study, and it was an effective introduction to the topics. - Mystery Resource Buyer”

HOW THIS MYSTERY WILL HELP YOU



- Prep-FREE and fully editable Mystery Investigation - just print/upload and assign with no materials.
- Evidence Cards can be printed with and without images or projected on board.
- Engages every learner through hands-on, high-interest mystery investigations that boost motivation and participation.
- Builds essential skills such as graph interpretation, problem-solving, teamwork, creativity, and communication.



A complete student case file
with guided worksheets for
every step of the investigation.



10 detailed evidence cards
based on real microplastics
research and real-world
examples that include images,
graphs, and text.



A full teacher answer key with
sample responses and support
for grading.

What You Get

10-PART INVESTIGATION

Full investigation
breakdown

Part 1 - Mission Briefing & Case Overview
Name: _____ Date: _____
Case File #317 - The Microplastics Mystery
Plastic was once considered one of the greatest inventions of modern society. It was cheap, strong, and convenient. But now, scientists around the world are discovering something alarming.
Tiny pieces of plastic—too small to see easily—have been found in water, soil, animals, and even inside the human body. These tiny pieces are alarming.
Microplastics have been detected in:
• Drinking water
• Fish and shellfish
• Table salt
• Air
• Human blood and lungs
No one is sure exactly how they are spreading so quickly. What is clear is that they are **everywhere**.
You are a science detective assigned to investigate.
Your Mission
1. Identify where microplastics come from.
2. Explain how they spread through the environment.
3. Describe why they are dangerous.
4. Propose solutions to reduce the problem.
This case will require careful thinking, attention to detail, and a commitment to the future of our environment—and possibly the discovery of new solutions.
Part 2 - Background: What Are Microplastics?
Read the background information provided.
1. What are microplastics?
2. How are microplastics different from other types of plastic?
3. Why do scientists find microplastics so alarming?

Part 4 - Suspect List: What is Causing the Problem?
Below are possible "suspects" in this case. Rank them from 1 (most responsible) to 10 (least responsible).

Suspect	Rank	Why You Ranked It This Way
Plastic bottles & packaging		
Synthetic clothing		
Car tires		
Cosmetic products		
Industrial waste		

Part 5 - Pathway Tracking: How Do Microplastics Spread?
Use arrows to show how microplastics move from source to environment to living organisms.
Example: Clothing → Washing machine → River → Fish → Humans
Your turn:
Source → Environment → Living Organisms

Part 6 - Impact Analysis
Impact on Animals
1. What problems can microplastics cause for animals?
Impact on Humans
2. Why are scientists concerned about microplastics in the human body?
Impact on Ecosystems
3. How might microplastics affect food chains and ecosystems?

Part 7 - The Big Question
How did microplastics end up everywhere?
Write a clear explanation using evidence from the case.

Evidence Card 8 - Fish Market Testing
Scientists tested fish sold in markets and grocery stores. Many of the fish contained microplastics in their digestive systems. Some particles were also found in edible tissues.
Detective Notes Prompt:
What does this mean for people who eat seafood?

Evidence Card 9 - Air Samples
Microplastics have been found floating in the air in cities and even in remote mountain areas. People may be inhaling plastic particles without realizing it.
Airborne Microplastics
Microplastics have been found floating in the air in cities and even in remote mountain areas. People may be inhaling plastic particles without realizing it.
Detective Notes Prompt:
What new pathway of exposure does this reveal?

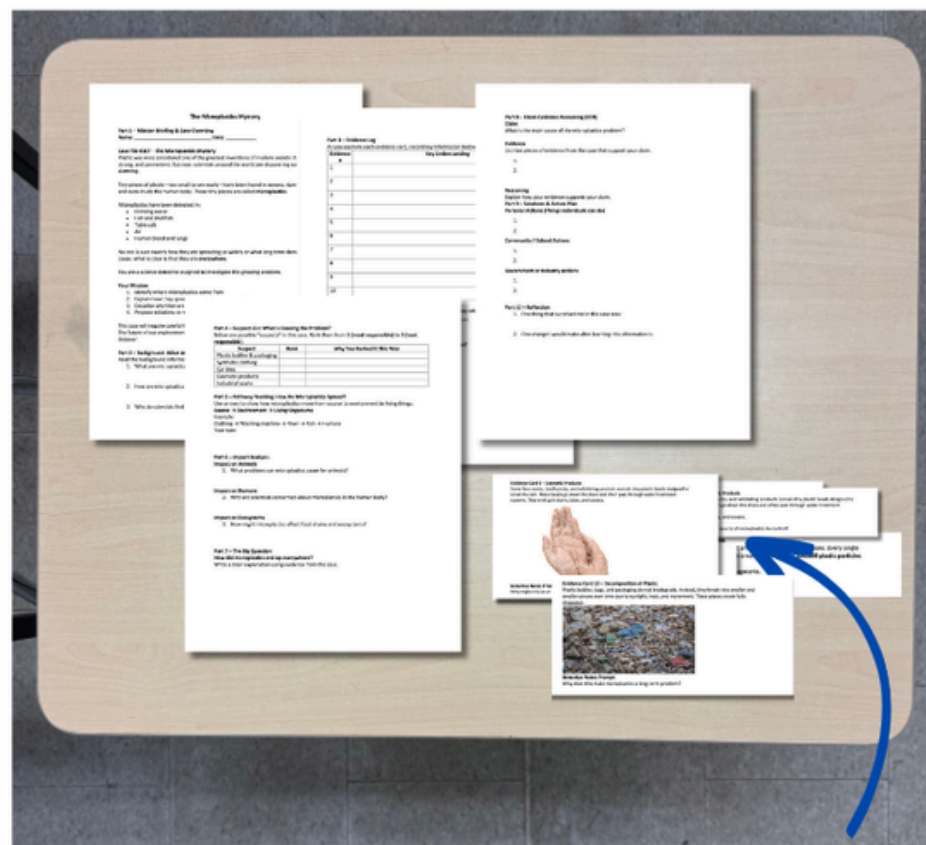
Evidence Card 10 - Decomposition of Plastic
Plastic bottles, bags, and packaging do not biodegrade. Instead, they break into smaller and smaller pieces over time due to sunlight, heat, and movement. These pieces never fully disappear.
Detective Notes Prompt:
Why does this make microplastics a long-term problem?

Interpretation of Data

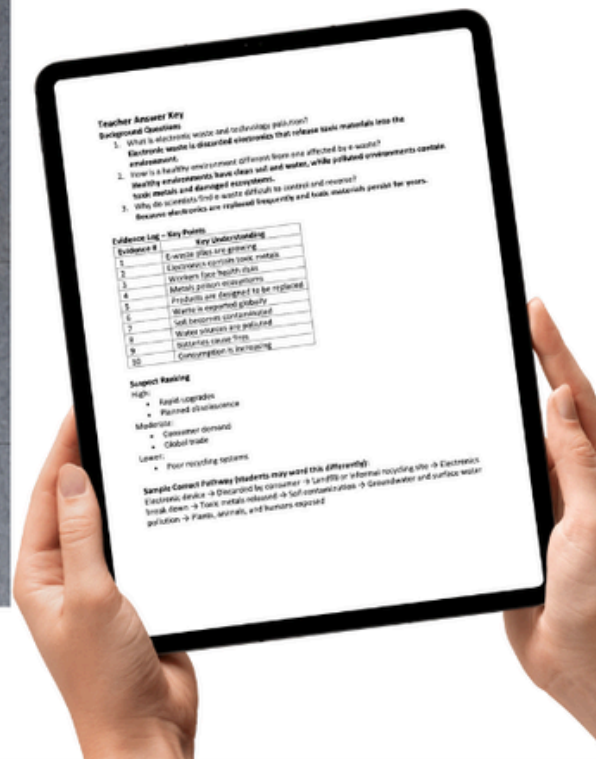
10 Evidence Cards to Determine Culprit

What Will Your Students Learn?

FULLY EDITABLE AND READY-TO-GO INVESTIGATION



**FULL
ANSWER KEY**



EVIDENCE CARDS

“

★★★★★ This product will make a great addition of Environmental Mystery Mondays for my Environmental Issues Curriculum, with no teacher prep needed. - Mystery Resource Buyer

”

- ✓ What microplastics are, where they come from, and how they form in the environment.
- ✓ How microplastics move through water, air, animals, and the human body.
- ✓ Why microplastics are harmful and how human choices impact ecosystems and health.
- ✓ How to analyze data and evidence to identify patterns and draw conclusions.
- ✓ How to use Claim-Evidence-Reasoning (CER) to support scientific arguments.
- ✓ How to trace cause-and-effect relationships in complex environmental systems.

Upgrade to the Environmental Science Detective Mystery Bundle

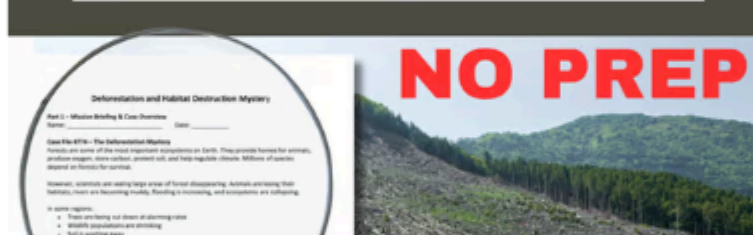
Get all my Environmental Science Mystery Activities plus all additional ones I create in the future.

ENVIRONMENTAL SCIENCE
DETECTIVE MYSTERY BUNDLE

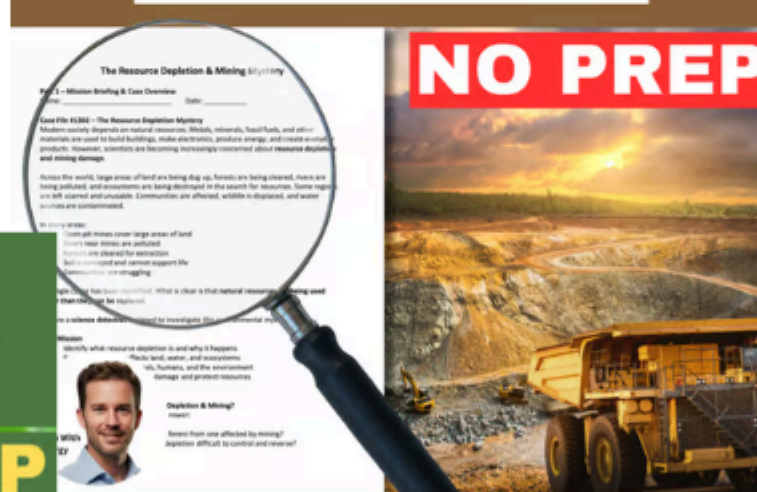
MICROPLASTICS MYSTERY DETECTIVE FILE ON PLASTIC POLLUTION & HUMAN IMPACT



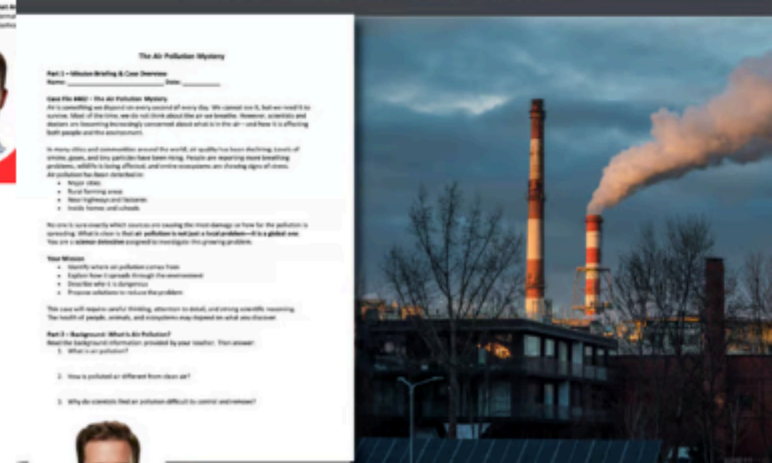
DEFORESTATION & HABITAT DESTRUCTION MYSTERY



THE RESOURCE DEPLETION & MINING MYSTERY



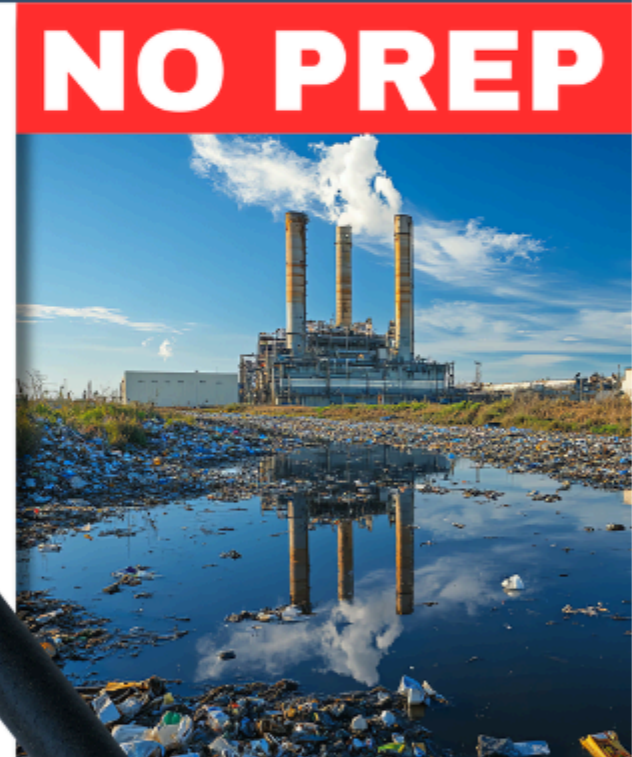
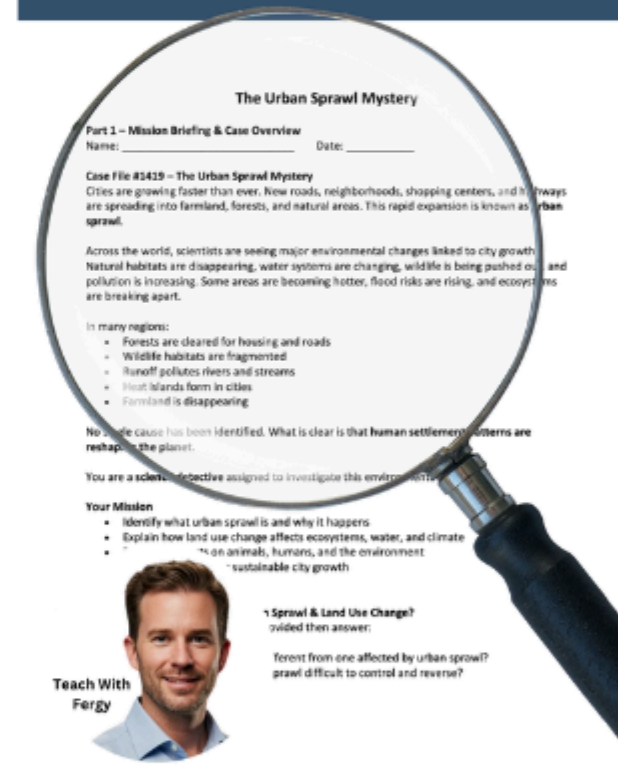
THE AIR POLLUTION MYSTERY DETECTIVE FILE ON AIR POLLUTION & THE ENVIRONMENT



THE INVASIVE SPECIES MYSTERY



DETECTIVE FILE ON HOW HUMANS IMPACT THE ENVIRONMENT



DETECTIVE FILES ON HOW HUMANS IMPACT THE ENVIRONMENT

Plus Many More!
Click Here

Part 1 & 2

The Microplastics Mystery

Part 1 – Mission Briefing & Case Overview

Name: _____ Date: _____

Case File #317 – The Microplastics Mystery

Plastic was once considered one of the greatest inventions of modern society. It was cheap, strong, and convenient. But now, scientists around the world are discovering something alarming.

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Microplastics have been detected in:

- Drinking water
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- Human blood and lungs

No one is sure exactly how they are spreading so widely or what long-term damage they may cause. What is clear is that they are **everywhere**.

You are a science detective assigned to investigate this growing problem.

Your Mission

1. Identify where microplastics come from
2. Explain how they spread through the environment
3. Describe why they are dangerous
4. Propose solutions to reduce the problem

This case will require careful thinking, attention to detail, and strong scientific reasoning. The future of our environment—and possibly human health—may depend on what you discover.

Part 2 – Background: What Are Microplastics?

Read the background information provided by your teacher. Then answer:

1. What are microplastics?
2. How are microplastics different from regular plastic trash?
3. Why do scientists find microplastics difficult to remove from the environment?

Part 1 – Mission Briefing & Case Overview

Students are introduced to the microplastics problem and take on the role of science detectives. They learn their mission and begin the investigation with a real-world hook.

Part 2 – Background: What Are Microplastics?

Students read a short, accessible background passage and answer guiding questions to build foundational understanding before analyzing evidence.

Part 3

Part 3 – Evidence Log

Students begin examining the evidence cards and record key information, observations, and insights in their evidence log.

Part 3 – Evidence Log

As you examine each evidence card, record key information below.

Evidence #	Key Understanding
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Repeat this structure for each Evidence Card and place the key information in the chart above.

Evidence Card #: _____

1. Summarize the evidence in your own words:
2. What does this evidence suggest about microplastics?
 - ☐ Where they come from
 - ☐ How they spread
 - ☐ Their impact on living things
 - ☐ All of the aboveExplain your choice:
3. What question does this evidence raise for you?

Evidence Card 10 – Decomposition of Plastic

Plastic bottles, bags, and packaging do not biodegrade. Instead, they break into smaller and smaller pieces over time due to sunlight, heat, and movement. These pieces never fully disappear.



Detective Notes Prompt:

Why does this make microplastics a long-term problem?

Evidence Card 6 – Cosmetic Products

Some face scrubs, toothpastes, and exfoliating products contain tiny plastic beads designed to scrub the skin. These beads go down the drain and often pass through water treatment systems. They end up in rivers, lakes, and oceans.



Detective Notes Prompt:

Why might this be an easy source of microplastics to control?

EVIDENCE CARDS

➤ All Evidence Cards come in two versions -
With images and graphs and Without and can be
printed or projected as needed.

➤ Students analyze each Evidence Card and
record the following in their Evidence Log

1. Summarize the evidence in their own words.
2. Determine what this evidence suggests
 - ☐ What causes it
 - ☐ Pathway
 - ☐ Its impact on living things
3. Explain what question(s) this evidence raises
for them?

Images
&
Graphs

Evidence Card 8 – Fish Market Testing

Scientists tested fish sold in markets and grocery stores. Many of the fish had microplastics in their digestive systems. Some particles were also found in the fish's blood.

Detective Notes Prompt:

What does this mean for people who eat seafood?

Evidence Card 9 – Air Samples

Microplastics have been found floating in the air in cities and even in remote mountain areas. People may be inhaling plastic particles without realizing it.

Airborne Microplastics

Microplastics have been found floating in the air in cities and even in remote mountain areas. People may be inhaling plastic particles without realizing it.

People may be inhaling plastic particles without realizing it.

Detective Notes Prompt:

What new pathway of exposure does this reveal?

Evidence Card 10 – Decomposition of Plastic

Plastic bottles, bags, and packaging do not biodegrade. Instead, they break down into smaller pieces over time due to sunlight, heat, and movement.



Detective Notes Prompt:

Why does this make microplastics a long-term problem?

EVIDENCE CARDS – No Images

Evidence Card 1 – Ocean Water Samples

Scientists collected water samples from the Atlantic, Pacific, and Indian Oceans. Every single sample contained microplastic particles. Some areas had more than **100,000 plastic particles per square kilometer**.

Many of the particles were small fibers and fragments.

Detective Notes Prompt:

What does this suggest about how widespread microplastics are?

Evidence Card 2 – Synthetic Clothing

Researchers studied water from washing machines after loads of polyester and nylon clothing were washed. Each load released **hundreds of thousands of tiny plastic fibers** into the wastewater.

Most wastewater treatment plants are not designed to filter out particles this small.

Detective Notes Prompt:

How could washing clothes be connected to plastic in rivers and oceans?

Evidence Card 3 – Sea Turtle Autopsy

A dead sea turtle was found washed up on shore. During examination, scientists discovered microplastics in its stomach and intestines. The turtle had signs of internal inflammation and blockage.

The turtle's digestive system was damaged.

Detective Notes Prompt:

What does this suggest about how microplastics affect animals?

Evidence Card 4 – Bottle Study

A study of plastic bottles from different brands. Over **90% of the bottles contained microplastics**. The most common type matched the plastic used to make bottles and caps.

Detective Notes Prompt:

What does this suggest about the source of these microplastics?

Evidence Card 5 – Human Blood Samples

In a recent study, scientists tested human blood samples and found microplastics in most of the people tested. The particles were small enough to travel through the bloodstream. Researchers are still studying what this could mean for long-term health.

Detective Notes Prompt:

Why is this evidence especially concerning?

No
Images

Part 4-7

Part 4 – Suspect List: What Is Causing the Problem?

Below are possible “suspects” in this case. Rank them from 1 (most responsible) to 5 (least responsible).

Suspect	Rank	Why You Ranked It This Way
Plastic bottles & packaging		
Synthetic clothing		
Car tires		
Cosmetic products		
Industrial waste		

Part 5 – Pathway Tracking: How Do Microplastics Spread?

Use arrows to show how microplastics move from source to environment to living things.

Source → Environment → Living Organisms

Example:

Clothing → Washing machine → River → Fish → Humans

Your turn:

Part 6 – Impact Analysis

Impact on Animals

1. What problems can microplastics cause for animals?

Impact on Humans

2. Why are scientists concerned about microplastics in the human body?

Impact on Ecosystems

3. How might microplastics affect food chains and ecosystems?

Part 7 – The Big Question

How did microplastics end up everywhere?

Write a clear explanation using evidence from the case.

Part 4 – Evidence Analysis

Students summarize each piece of evidence, identify what it reveals about microplastics, and generate questions, building critical thinking and reasoning skills.

Part 5 – Suspect List

Students rank possible sources of microplastics, defend their choices, and determine which human activities are most responsible for the problem.

Part 6 – Pathway Tracking

Students trace how microplastics move from everyday sources through the environment and into living organisms, strengthening cause-and-effect understanding.

Part 7 – Impact Analysis

Students analyze how microplastics affect animals, humans, and ecosystems, using evidence from the case to support their answers.

Part 8-10

Part 8 – Claim-Evidence-Reasoning (CER)

Claim

What is the main cause of the microplastics problem?

Evidence

List two pieces of evidence from the case that support your claim.

- 1.
- 2.

Reasoning

Explain how your evidence supports your claim.

Part 9 – Solutions & Action Plan

Personal Actions (Things individuals can do)

- 1.
- 2.

Community / School Actions

- 1.
- 2.

Government or Industry Actions

- 1.
- 2.

Part 10 – Reflection

1. One thing that surprised me in this case was:

2. One change I would make after learning this information is:

Part 8 – The Big Question

Students synthesize all their learning to explain how microplastics ended up everywhere, using evidence from the investigation.

Part 9 – Claim-Evidence-Reasoning (CER)

Students write a structured scientific argument, making a claim, supporting it with evidence, and explaining their reasoning.

Part 10 – Reflection and Solutions

Students propose realistic actions at the personal, school, and government levels, moving from awareness to problem-solving.

Full Teacher Answer Key

TEACHER ANSWER KEY

Background Questions

- 1. **What are microplastics?**
Tiny plastic particles less than 5 mm in size.
- 2. **How are microplastics different from regular plastic trash?**
They are much smaller and harder to see, making them difficult to clean up.
- 3. **Why do scientists find microplastics difficult to remove from the environment?**
They are tiny, widespread, and easily pass through filters.

Evidence Log – Key Points

Evidence	Key Understanding
1 – Ocean samples	Microplastics are widespread in oceans.
2 – Clothing	Washing synthetic clothes releases fibers.
3 – Sea turtle	Animals ingest microplastics.
4 – Bottled water	Packaging contributes to microplastics.
5 – Human blood	Microplastics can enter the body.
6 – Cosmetics	Some products intentionally add plastic.
7 – Tires	Driving creates microplastic pollution.
8 – Fish market	Humans may eat microplastics.
9 – Air samples	Microplastics can be inhaled.
10 – Decomposition	Plastics never fully disappear.

Suspect Ranking (Expected Reasoning)

Most students should rank:

- **Plastic bottles/packaging** – high responsibility
- **Synthetic clothing** – high
- **Tires** – moderate to high
- **Cosmetics** – moderate
- **Industrial waste** – varies

Justification should mention frequency, volume, and everyday use.

Pathway Tracking – Sample Answers

- Plastic bottle → breaks down → river → fish → humans
- Clothing → washer → wastewater → ocean → animals
- Tires → road runoff → storm drains → lakes → fish

Impact Analysis

Animals

- Digestive blockage
- Inflammation
- Starvation due to false fullness

Humans

- Unknown long-term health effects
- Possible inflammation, organ damage
- Concern because particles enter bloodstream

Ecosystems

- Disrupted food chains
- Accumulation in predators
- Reduced animal health and population stability

Big Question – Sample Response

Microplastics come from the breakdown of plastic products and are released through washing clothes, driving cars, and everyday plastic use. They enter water, air, and soil, where animals and humans are exposed through food, water, and breathing.

CER Example

Claim:

The main cause of microplastics is the breakdown and everyday use of plastic products.

Evidence:

- Evidence Card 2 (clothing fibers)
- Evidence Card 10 (plastic breaking down)

Reasoning:

Washing clothes releases fibers, and plastics break into smaller pieces over time. This shows that normal use of plastic leads directly to microplastics in the environment.

Solutions – Expected Ideas

Personal:

- Use reusable bottles
- Avoid microbead products
- Reduce plastic packaging

Community:

- Recycling programs
- School plastic bans
- Clean-up events

Government:

- Ban on single-use plastics
- Regulations on microbead products
- Funding for research on microplastics

- Public awareness campaigns
- Incentives for sustainable practices
- International agreements

- Support for clean water initiatives
- Encouragement of sustainable consumption
- Research into biodegradable alternatives

- Education on proper disposal
- Promotion of local recycling
- Collaboration with businesses

- Advocacy for policy changes
- Support for environmental organizations
- Encouragement of sustainable living

- Promotion of sustainable agriculture
- Support for renewable energy
- Encouragement of green building

- Advocacy for sustainable transportation
- Support for sustainable fashion
- Encouragement of sustainable tourism

Background Reading: What Are Microplastics?

Plastic pollution is no longer just about large, visible trash like bottles, bags, and packaging. Today, scientists are increasingly concerned about **microplastics**—tiny pieces of plastic that are spreading through the environment and even entering the human body.

Microplastics are **plastic particles smaller than 5 millimeters**, which is about the size of a sesame seed or smaller. Some microplastics are created on purpose, such as the tiny plastic beads that were once used in face scrubs and toothpaste. Others form when larger plastic items, like bottles, bags, and containers, break apart over time. Sunlight, heat, wind, and waves cause plastic to become brittle and fragment into smaller and smaller pieces. Unlike natural materials, **plastic does not biodegrade**. This means it does not break down into harmless substances. Instead, plastic only breaks into smaller pieces. A single plastic bottle can eventually turn into thousands of microplastic particles. Because of this, microplastics continue to build up in the environment.

How Are Microplastics Different from Regular Plastic Trash?

Regular plastic trash is usually easy to see. Items like bags, straws, and wrappers are large enough to be picked up during cleanups. Microplastics, however, are **tiny and often invisible to the human eye**. This makes them much harder to find and remove. Microplastics also behave differently in the environment. Because they are so small and lightweight, they can be **carried by wind and water**. This allows them to spread far from where they were originally created. Microplastics have been found in oceans, rivers, soil, food, and even in remote areas far from cities. Another key difference is how microplastics interact with living things. Animals can easily mistake microplastics for food. Fish, seabirds, turtles, and even plankton have been found with microplastics in their bodies. Once inside an organism, these particles can cause harm and may move through the food chain.

Why Are Microplastics Difficult to Remove from the Environment?

Scientists find microplastics extremely difficult to remove because of their **small size and widespread distribution**. Many microplastics are too tiny to be filtered out by wastewater treatment plants. For example, synthetic clothing made from polyester, nylon, and acrylic releases tiny plastic fibers every time it is washed. These fibers often pass through treatment systems and end up in rivers and oceans. Microplastics are also constantly being created. As plastic waste continues to break down, new microplastics are formed. This means the problem does not stay the same—it grows over time. Microplastics are found in **water, soil, air, and living organisms**, there is no single place where they can be easily collected. They are mixed into ecosystems, carried by animals, and even floating in the ocean. This makes clean-up extremely challenging.

Why Are Scientists Concerned?

Microplastics have been found in human blood, lungs, liver, kidneys, and even the placenta. People are exposed through food, drinking water, and the air. New research in 2025 raised concerns about possible links between microplastic exposure and serious health conditions, including heart disease and Alzheimer’s disease. Scientists believe microplastics may cause inflammation in the body and interfere with normal biological processes.

Although research is still ongoing, most scientists agree that microplastics are **not harmless** and pose risks to both ecosystems and human health.

Background Reading

As a special bonus, I want to send you a few resources that you can use in your classroom tomorrow. Completely free and geared towards what you teach!



Just



and then choose what you teach!

thanks
**for your interest
in this resource!**



devon@teachwithfergy.com

Upgrade to the Environmental Science Detective Mystery Bundle

Get all my Environmental Science Mystery Activities plus all additional ones I create in the future.

ENVIRONMENTAL SCIENCE DETECTIVE MYSTERY BUNDLE

MICROPLASTICS MYSTERY DETECTIVE FILE ON PLASTIC POLLUTION & HUMAN IMPACT



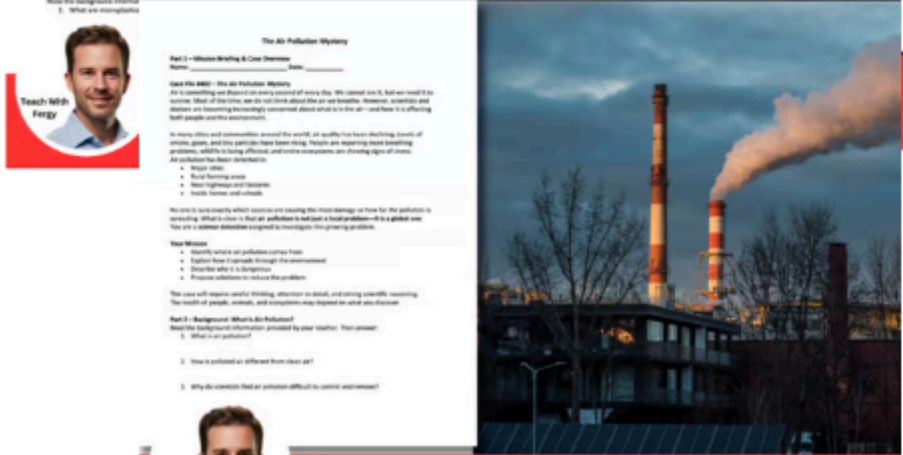
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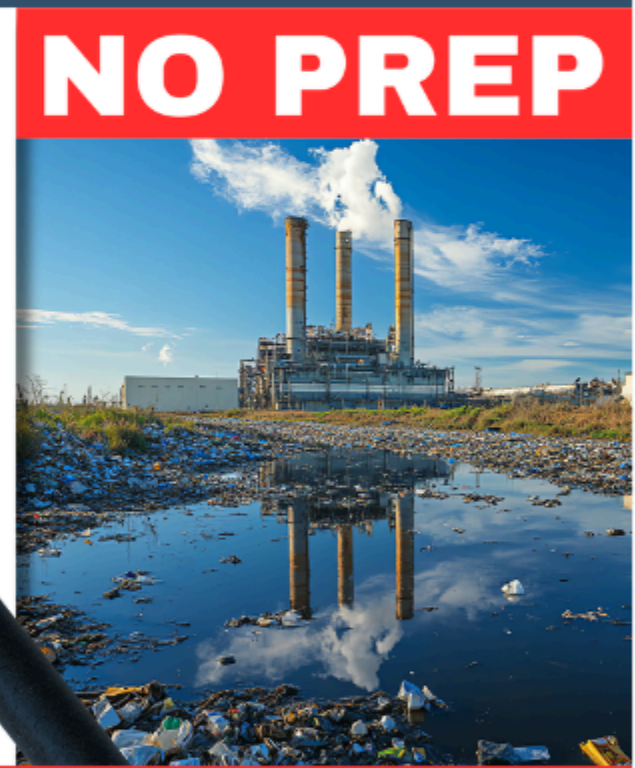
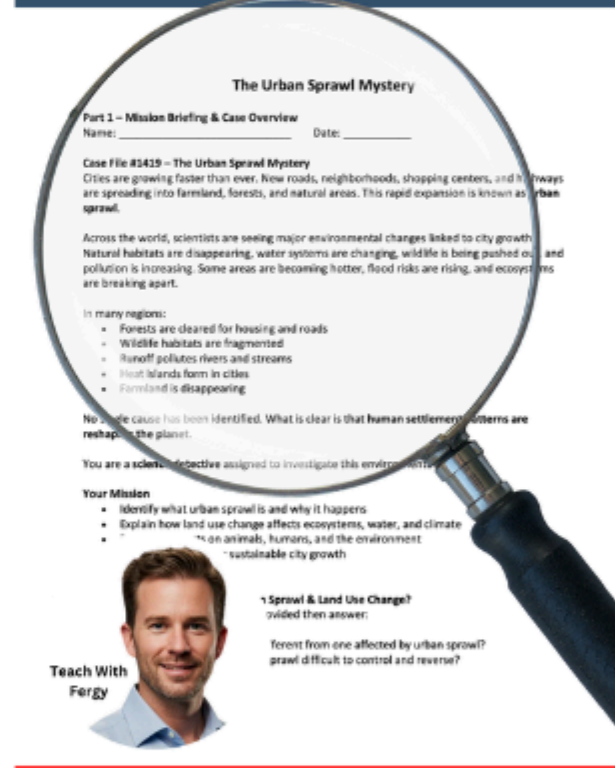
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