

THE E-WASTE & TECHNOLOGY POLLUTION MYSTERY

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

NO PREP



SCROLL
to take a look inside!



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

The E-Waste & Technology Pollution Mystery

Part 1 – Mission Briefing & Case Overview

Name: _____ Date: _____

Case File #1431 – The E-Waste & Technology Pollution Mystery

Every year, millions of phones, laptops, tablets, batteries, and other electronic devices are thrown away. As technology advances, devices are replaced faster than ever before. Many people assume old electronics are safely recycled, but scientists are discovering serious environmental and health problems linked to electronic waste.

Across the world:

- Piles of discarded electronics are growing rapidly
- Toxic metals are leaking into soil and water
- Informal recycling sites expose workers to dangerous chemicals
- Wildlife and ecosystems are being contaminated
- Communities near dumping sites face health risks

Electronic waste, also called **e-waste**, contains harmful materials such as lead, mercury, cadmium, and lithium. When electronics are dumped or improperly recycled, these substances can escape into the environment.

No single cause has been identified. What is clear is that modern technology use and disposal habits are creating a growing global problem.

You are a science detective assigned to investigate this environmental mystery.

Your Mission

- Identify what e-waste is and why it is increasing
- Explain how e-waste affects land, water, and ecosystems
- Discuss the impact of e-waste on animals, humans, and communities
- Investigate the causes of technology pollution

The E-Waste & Technology Pollution Crisis?

What is the problem? How is it being solved, then answer:
What is technology pollution?
How is it different from one affected by e-waste?
Why is electronic waste difficult to control and reverse?

Teach With
Fergy



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 E-Waste & Technology Pollution.
4. Interrogate suspects (rapid technology upgrades, poor recycling, 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 E-Waste & Technology Pollution 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

NO-PREP. JUST PRINT TO GO!

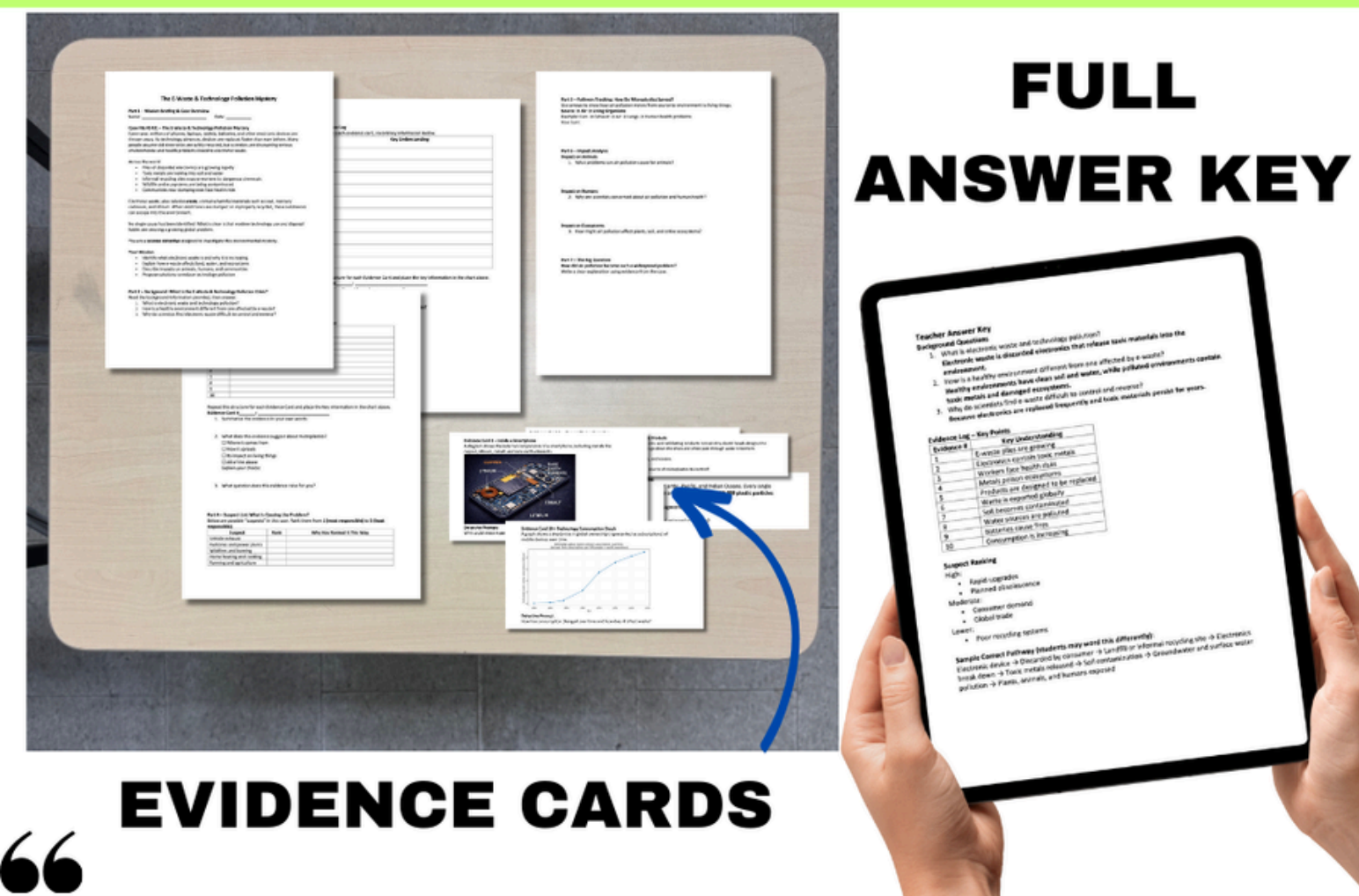
Full investigation breakdown

Interpretation & Recording Data

10 Evidence Cards to Determine Culprit

What Will Your Students Learn?

FULLY EDITABLE AND READY-TO-GO INVESTIGATION



“

★★★★★ 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 electronic waste and technology pollution are and why they are increasing
- ✓ How toxic materials from electronics pollute soil, water, and ecosystems
- ✓ Why e-waste harms wildlife, human health, and vulnerable communities
- ✓ How consumer choices and technology use connect to environmental problems
- ✓ 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



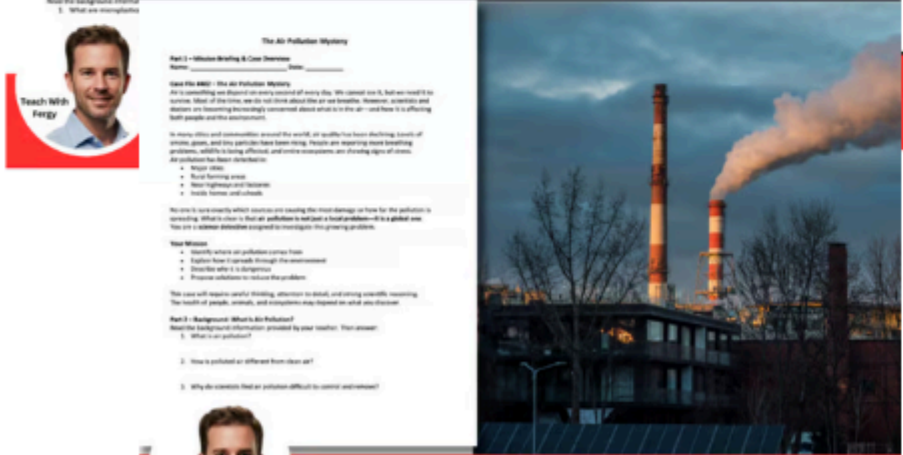
DEFORESTATION & HABITAT DESTRUCTION MYSTERY



THE RESOURCE DEPLETION & MINING MYSTERY



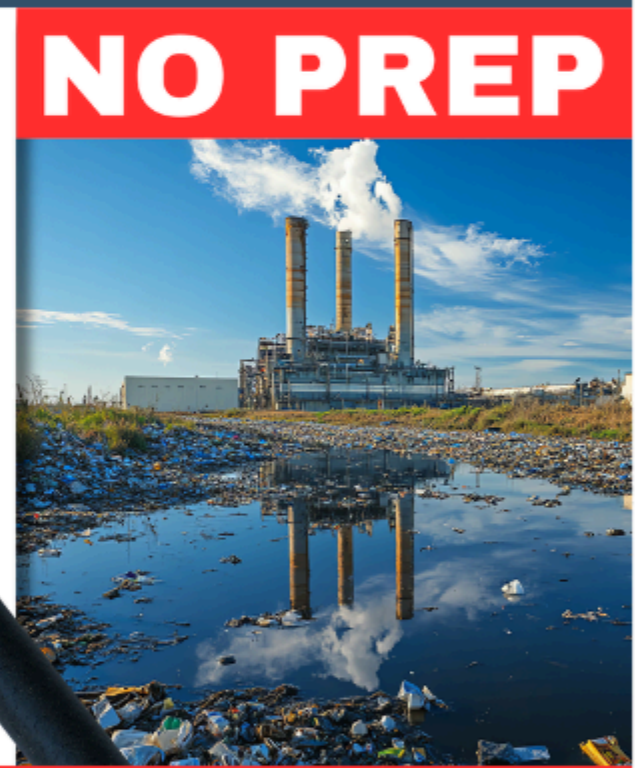
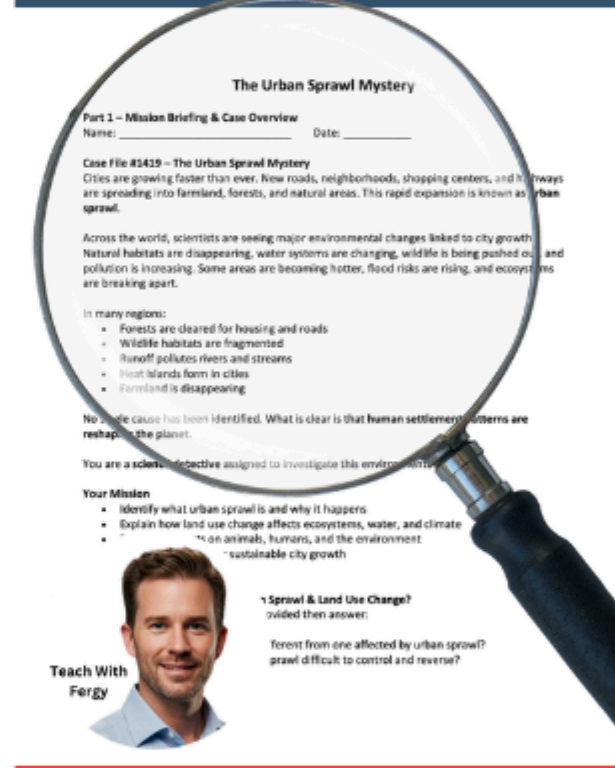
THE AIR POLLUTION MYSTERY DETECTIVE FILE ON AIR POLLUTION & THE ENVIRONMENT



THE INVASIVE SPECIES MYSTERY



DETECTIVE FILE ON HOW HUMANS IMPACT THE ENVIRONMENT



DETECTIVE FILES ON HOW HUMANS IMPACT THE ENVIRONMENT

Plus Many More!
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Part 1 & 2

The E-Waste & Technology Pollution Mystery

Part 1 – Mission Briefing & Case Overview

Name: _____ Date: _____

Case File #1431 – The E-Waste & Technology Pollution Mystery

Every year, millions of phones, laptops, tablets, batteries, and other electronic devices are thrown away. As technology advances, devices are replaced faster than ever before. Many people assume old electronics are safely recycled, but scientists are discovering serious environmental and health problems linked to electronic waste.

Across the world:

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- Toxic metals are leaking into soil and water
- Informal recycling sites expose workers to dangerous chemicals
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- Communities near dumping sites face health risks

Electronic waste, also called **e-waste**, contains harmful materials such as lead, mercury, cadmium, and lithium. When electronics are dumped or improperly recycled, these substances can escape into the environment.

No single cause has been identified. What is clear is that modern technology use and disposal habits are creating a growing global problem.

You are a **science detective** assigned to investigate this environmental mystery.

Your Mission

- Identify what electronic waste is and why it is increasing
- Explain how e-waste affects land, water, and ecosystems
- Describe impacts on animals, humans, and communities
- Propose solutions to reduce technology pollution

Part 2 – Background: What Is the E-Waste & Technology Pollution Crisis?

Read the background information provided, then answer:

1. What is electronic waste and technology pollution?
2. How is a healthy environment different from one affected by e-waste?
3. Why do scientists find electronic waste difficult to control and reverse?

Part 1 – Mission Briefing & Case Overview

Students are introduced to E-Waste & Technology Pollution 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 is E-Waste & Technology Pollution?

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

Part 3 & 4

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 # _____: _____

- Summarize the evidence in your own words.
- What does this evidence suggest about electronic waste?
 - ☐ What causes it
 - ☐ Pathway
 - ☐ Its impact on living thingsExplain your choice:
- What question does this evidence raise for you?

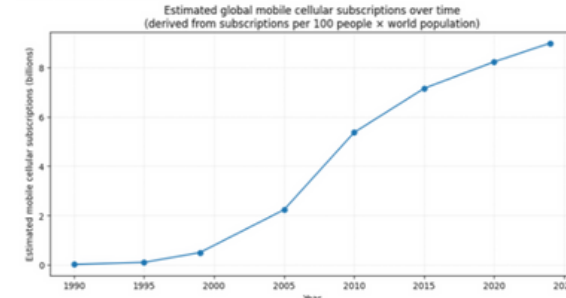
Part 4 – Suspect List: What Is Causing the Waste?

Rank the suspects from 1 (most responsible) to 5 (least responsible).

Suspect	Rank	Why You Ranked It This Way
Rapid technology upgrades		
Planned obsolescence		
Consumer demand		
Poor recycling systems		
Global e-waste trade		

Evidence Card 10 – Technology Consumption Graph

A graph shows a steady rise in global ownership (represented as subscriptions) of mobile devices over time.



Detective Prompt:

How has consumption changed over time and how does it affect waste?

Evidence Card 2 – Inside a Smartphone

A diagram shows the internal components of a smartphone, including metals like copper, lithium, cobalt, and rare earth elements.



Detective Prompt:
Why could these materials be problematic?

Evidence Card 8 – Water Contamination Diagram

A diagram illustrates toxic substances leaking from buried electronics into groundwater. Arrows show how pollutants move through soil layers into water sources.



Detective Prompt:

Why is this dangerous for people?

Part 4 – Evidence Analysis

Students summarize each piece of evidence, identify what it reveals about E-Waste & Technology Pollution, and generate questions, building critical thinking and reasoning skills.

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 9 – Battery Fire Image

A lithium battery fire burns intensely at a waste facility. Flame-damaged batteries can react violently when crushed or impaled.



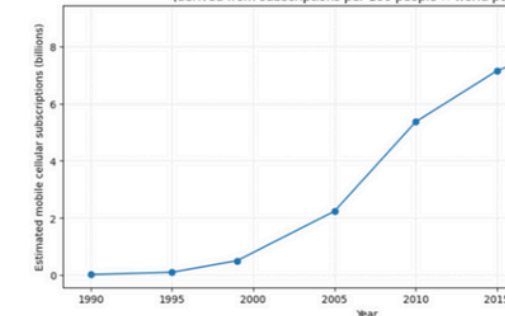
Detective Prompt:

What risks do batteries create?

Evidence Card 10 – Technology Consumption Graph

A graph shows a steady rise in global ownership (represented by mobile devices) over time.

Estimated global mobile cellular subscriptions over time (derived from subscriptions per 100 people x world population)



Detective Prompt:

How has consumption changed over time and how does it affect the environment?

Evidence Card 4 – Toxic Metals Chart

A chart lists toxic metals commonly found in electronics, such as lead, mercury, and cadmium. Each metal is associated with environmental and health concerns when released.

Common Toxic Metals in Electronics — Approximate Percentages & Concerns

Toxic Metal	Approximate % in Electronics or Components	Main Environmental & Health Concerns
Lead (Pb)	~0.1–0.5% typical in many components; up to 20–25% PbO (lead (II) oxide) in old CRT glass	Neurotoxin; affects brain and nervous system; can leach into soil/water from landfills.
Cadmium (Cd)	~0.01–0.1% typical in batteries & some components	Toxic to kidneys and bones; persists in environment.
Mercury (Hg)	~0.01% or less in older lamps/batteries/screens	Highly toxic; bioaccumulates in food webs, harms nervous system.
Chromium (Cr, incl. Cr ⁶⁺)	Small % in some components; regulated ≤0.1%	Carcinogenic (Cr ⁶⁺); environmental contaminant.

Detective Prompt:

What happens when these enter the environment?

Evidence Card 5 – Planned Obsolescence Ad

An advertisement encourages consumers to upgrade to a new device every year. The message promotes new features and styles rather than long-term use.

Detective Prompt:

How does design affect the environment?

Evidence Card 6 – E-waste Export

E-waste is being exported from wealthier countries like the United States, the U.K., and Japan to poorer regions that have less regulations like South Asia, China, and India.

Detective Prompt:

Why is e-waste moved globally?

No
Images

Part 5-7

Part 5 – Pathway Tracking: How Does E-Waste Affect the Environment?

Use arrows to show how electronic waste moves and causes environmental damage.

Example:

Device → Disposal → Dump/Recycling Site → Toxic metals → Soil & water → Human health

Your turn:

Part 6 – Impact Analysis

Impact on Land & Habitats

How does electronic waste affect soil, land, and habitats?

Impact on Water

How does e-waste affect groundwater, rivers, and oceans?

Impact on Animals & Humans

How does technology pollution affect wildlife and people?

Part 7 – The Big Question

How did electronic waste become such a widespread environmental and health problem?

Use evidence from the case.

Part 5 – Suspect List

Students rank possible sources of E-Waste & Technology Pollution, defend their choices, and determine which human activities are most responsible for the problem.

Part 6 – Pathway Tracking

Students trace how E-Waste & Technology Pollution leads to other environmental problems.

Part 7 – Impact Analysis

Students analyze how E-Waste & Technology Pollution affects 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 e-waste crisis in this case?

Evidence

List two pieces of evidence from the case.

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 the main cause of E-Waste & Technology Pollution in this case.

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 is electronic waste and technology pollution?
Electronic waste is discarded electronics that release toxic materials into the environment.
2. How is a healthy environment different from one affected by e-waste?
Healthy environments have clean soil and water, while polluted environments contain toxic metals and damaged ecosystems.
3. Why do scientists find e-waste difficult to control and reverse?
Because electronics are replaced frequently and toxic materials persist for years.

Evidence Log – Key Points

Evidence #	Key Understanding
1	E-waste piles are growing
2	Electronics contain toxic metals
3	Workers face health risks
4	Metals poison ecosystems
5	Products are designed to be replaced
6	Waste is exported globally
7	Soil becomes contaminated
8	Water sources are polluted
9	Batteries cause fires
10	Consumption is increasing

Suspect Ranking

High:

- Rapid upgrades
- Planned obsolescence

Moderate:

- Consumer demand
- Global trade

Lower:

- Poor recycling systems

Sample Correct Pathway (students may word this differently):

Electronic device → Discarded by consumer → Landfill or informal recycling site → Electronic break down → Toxic metals released → Soil contamination → Groundwater and surface water pollution → Plants, animals, and humans exposed

Other acceptable pathways include:

- Device → Exported to another country → Unsafe dismantling → Toxic smoke and runoff → Air and water pollution → Human health impacts
- Device → Improper recycling → Battery damage → Chemical leaks or fires → Environmental contamination

✓ Students should show **movement from human use → disposal → environmental spread → living organisms.**

Impact on Land & Habitats

Electronic waste affects land and habitats by contaminating soil with toxic metals such as lead, mercury, and cadmium. When electronics are dumped or broken apart, these substances leak into the ground, damaging soil quality and making it difficult for plants to grow. Contaminated land can no longer support healthy ecosystems, and habitats near e-waste sites often become unsafe for wildlife.

Impact on Water

E-waste affects water when toxic chemicals seep from landfills or recycling sites into groundwater, rivers, and lakes. Rainwater can carry pollutants from discarded electronics into nearby water systems. These toxins can poison aquatic organisms, contaminate drinking water sources, and spread pollution far from the original disposal site.

Impact on Animals & Humans

Technology pollution harms animals when toxic metals enter food chains, causing illness, reduced reproduction, or death. Humans can be exposed to these toxins through contaminated water, food, or air, especially workers at informal recycling sites. Long-term exposure can lead to health problems such as nervous system damage, developmental issues, and increased disease risk.

Big Question

Electronic waste became widespread because people replace devices frequently. Since electronics contain toxic materials, Evidence shows large amounts of pollution from device ownership (Evidence 10). Because recycling programs are often overwhelmed, pollution continues to spread.

Background Reading: What Is Electronic Waste and Technology Pollution?

Every day, people use phones, laptops, tablets, televisions, batteries, and many other electronic devices. Technology helps people communicate, learn, and work, but scientists are increasingly concerned about electronic waste and technology pollution—the environmental damage caused by discarded electronics.

Electronic waste, often called **e-waste**, includes any broken, outdated, or unwanted electronic device. When people replace phones, computers, or other electronics, the old devices are often thrown away. Some are recycled, but many end up in landfills or are shipped to other countries for disposal. Electronics contain metals and chemicals such as lead, mercury, cadmium, and lithium. These materials do not break down naturally and can pollute the environment when devices are dumped or improperly recycled.

As technology use increases and devices are replaced more often, the amount of electronic waste continues to grow. This makes e-waste one of the fastest-growing waste problems in the world.

Healthy environments depend on clean soil, safe water, and balanced ecosystems. When electronic waste builds up, these systems can be damaged.

How Is a Healthy Environment Different from One Affected by E-Waste?

A healthy environment has uncontaminated soil, clean water, and ecosystems that support plants and animals. Natural systems can function without exposure to toxic substances, and people can safely live, farm, and drink water.

An environment affected by e-waste is very different. When electronics break apart, toxic metals can leak into soil and water. This pollution can damage plant growth, poison animals, and make land unsafe for farming or living. Water sources near dumping or recycling sites may become contaminated, harming aquatic life and reducing access to clean drinking water.

Another key difference is long-term damage. Healthy environments can recover from small changes, but environments polluted by e-waste often remain damaged for many years because toxic metals persist and spread through ecosystems.

Why Is E-Waste So Difficult to Control and Reverse?

E-waste is difficult to control because people rely heavily on technology and replace devices frequently. New models are released often, and many electronics are designed to be replaced instead of repaired. Even when recycling programs exist, they cannot safely process all electronic waste.

Once toxic materials from electronics enter the environment, they are very hard to remove. Metals such as lead and mercury can remain in soil and water for decades. Groundwater contamination is especially difficult to clean up.

Electronic waste is also constantly being produced. As populations grow and technology use increases, more devices are thrown away every year. Because the problem is widespread, ongoing, and connected to global trade and consumer habits, scientists and governments face major challenges in reducing electronic waste and protecting the environment.

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

