The CENTRE for EDUCATION
in MATHEMATICS and COMPUTING

Electronic Waste

A CS and Society resource addressing economic and environmental issues within the realm of digital technology and computing

This resource will:

- discuss the causes and effects of electronic waste, and
- empower you to make choices that help reduce the amount of electronic waste in our world.

What Is Electronic Waste?

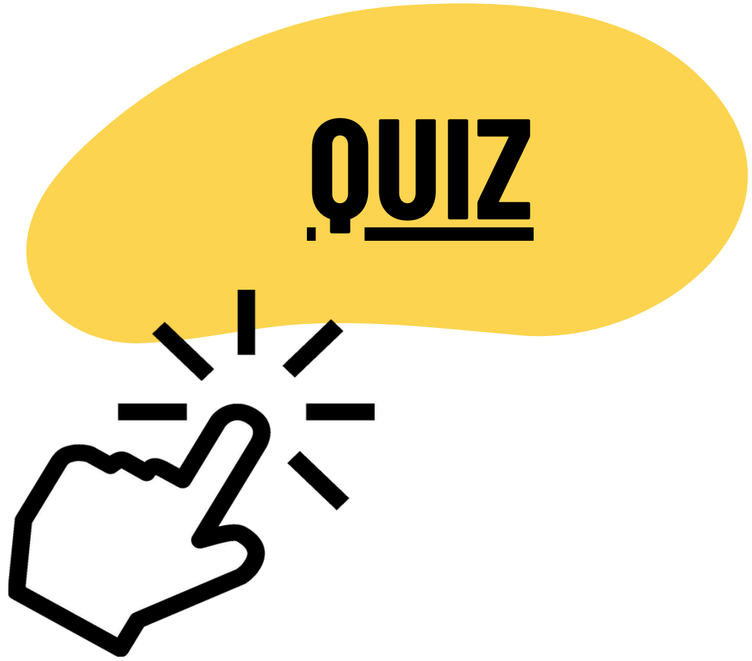
According to the Global E-Waste Monitor, in the year 2022 a record of 62 million tonnes of electronic waste was produced globally. This is equivalent to throwing away 800 laptops every second.

Electronic Waste (or E-Waste)
Discarded electronics that are no longer wanted, no longer working, or no longer useful.

Only 22.3% (less than one-quarter) of these discarded electronics were properly collected and recycled. Electronic waste contains hazardous materials. When discarded electronics are not carefully recycled, these toxic elements can be very harmful to both us and our environment.

What Do You Know?

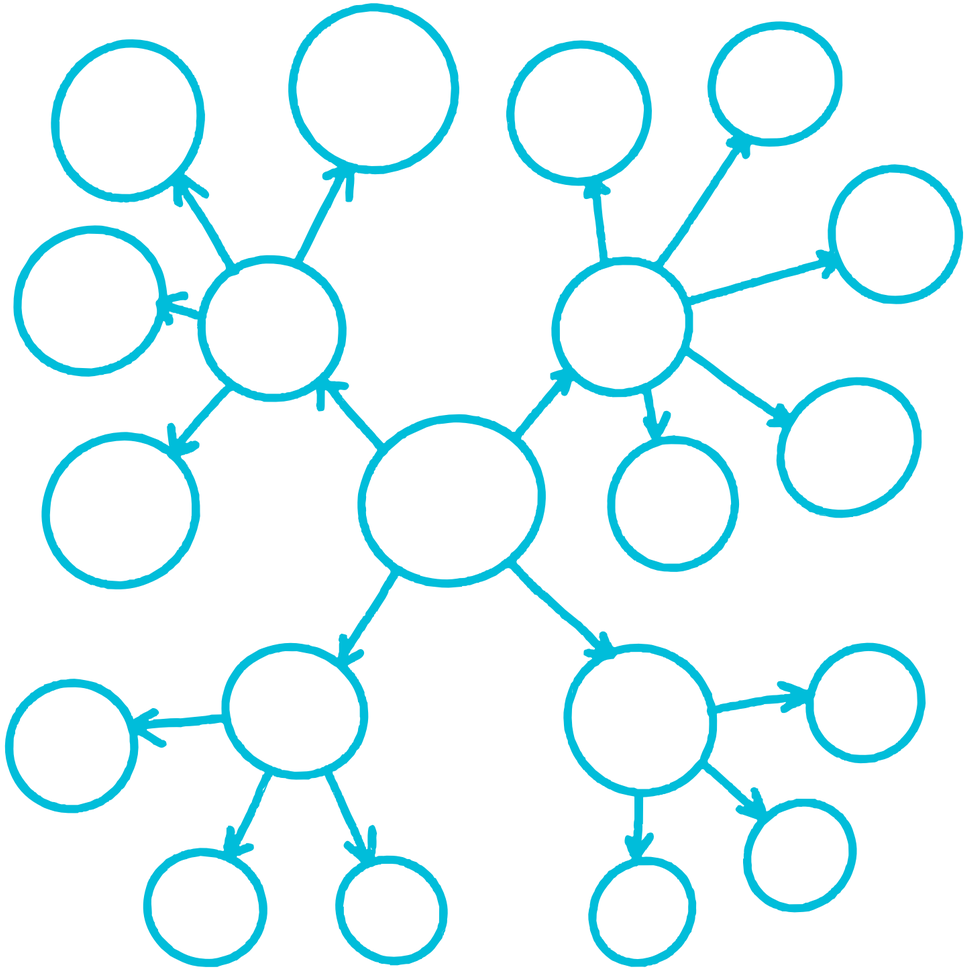
In the following quiz, discover what you know about electronic waste and its recycling.



Brainstorm

As a class, brainstorm the following questions:

- Why is there so much electronic waste?
- Why is so little electronic waste properly recycled?



Manufactured Obsolescence

The following video explains the different types of manufactured obsolescence, how they work, and what impact they have on consumers and the environment.

Manufactured Obsolescence: Discussion Questions

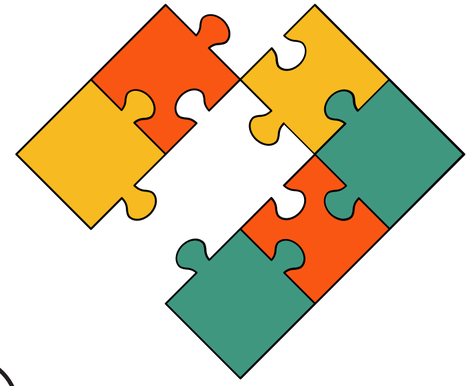
1. What is **planned obsolescence**?
2. Suppose you had an electronic device that broke. Are you more likely to replace it with a new device, or have it repaired? Why? What might make you change your mind?
3. What is **perceived obsolescence**?
4. Have you ever made a purchase based on the perceived obsolescence of a product? If so, describe your purchase.
5. Where does responsibility lie? Is it on companies to create more durable products that are easier to repair? Or is it on consumers to think more carefully about what they choose to buy?

Recycling Electronic Waste

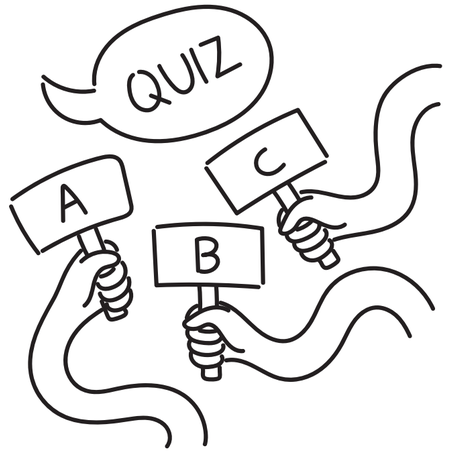
The following video describes what happens to electronic devices after they are dropped off for recycling. After watching the video, complete the summary found under additional materials.

E-Waste Toxins

Research a hazardous material found in electronic waste and create a game for others to play. Your game should answer the following questions:



1. What hazardous material did you choose?
2. What is the material's purpose in electronics?
3. What are the material's effects on the environment?
4. What are the material's effects on living things?
5. Can the material be safely recycled, and if so, how?



E-Waste Toxins: Examples

Here are some hazardous materials that can be found in electronic waste:

- Polychlorinated biphenyls (PCBs)
- Tetrabromobisphenol A (TBBPA)
- Polybrominated biphenyls (PBBs)
- Chlorofluorocarbons (CFCs)
- Polyvinyl chloride (PVC)
- Arsenic
- Beryllium
- Cadmium
- Chromium VI
- Lead
- Lithium
- Mercury
- Nickel
- Selenium
- Zinc sulphide

Think Twice

Advertisements try to persuade people to buy more products.
But what if instead, they persuaded people *not* to buy?

Find an advertisement for an electronic device and turn it into a meme that makes consumers think twice about buying it.

Reduce, Reuse, Recycle

You may be familiar with the three R's of Waste Management: **reduce**, **reuse**, and **recycle**. But did you know that the order of these R's matters? They are listed in order from most effective to least effective.

1. List three ways you can **reduce** the amount of electronics you personally own or use.
2. List two ways you can **reuse** or repurpose your unwanted electronics.
3. List one local place where you can bring your unwanted electronics for proper **recycling**.

More Information and Resources

General information:

Global E-Waste Monitor

The World Counts

World Health Organization

Repairing your electronics:

Right to Repair

iFixit

Recycling your electronics:

Recycle My Electronics

Electronic Recycling Association

Additional Materials

Something I agree with

Something I disagree with

Something I am unsure about

Something I have learned

Something I wonder about

Summary to accompany video: Recycling Electronic Waste