

LANDFILL & WASTE CRISIS

GRADE 8 AND UP READING



Sub Plan

Science
Applicability

Improve students'
literacy skills



Reading Comment



Extremely satisfied - Great resource to work on student reading comprehension and it tied into the topic I was teaching. My students have been struggling with reading and I've been incorporating more reading into my lessons. Thank you for the resource.



SCROLL
to take a look inside!

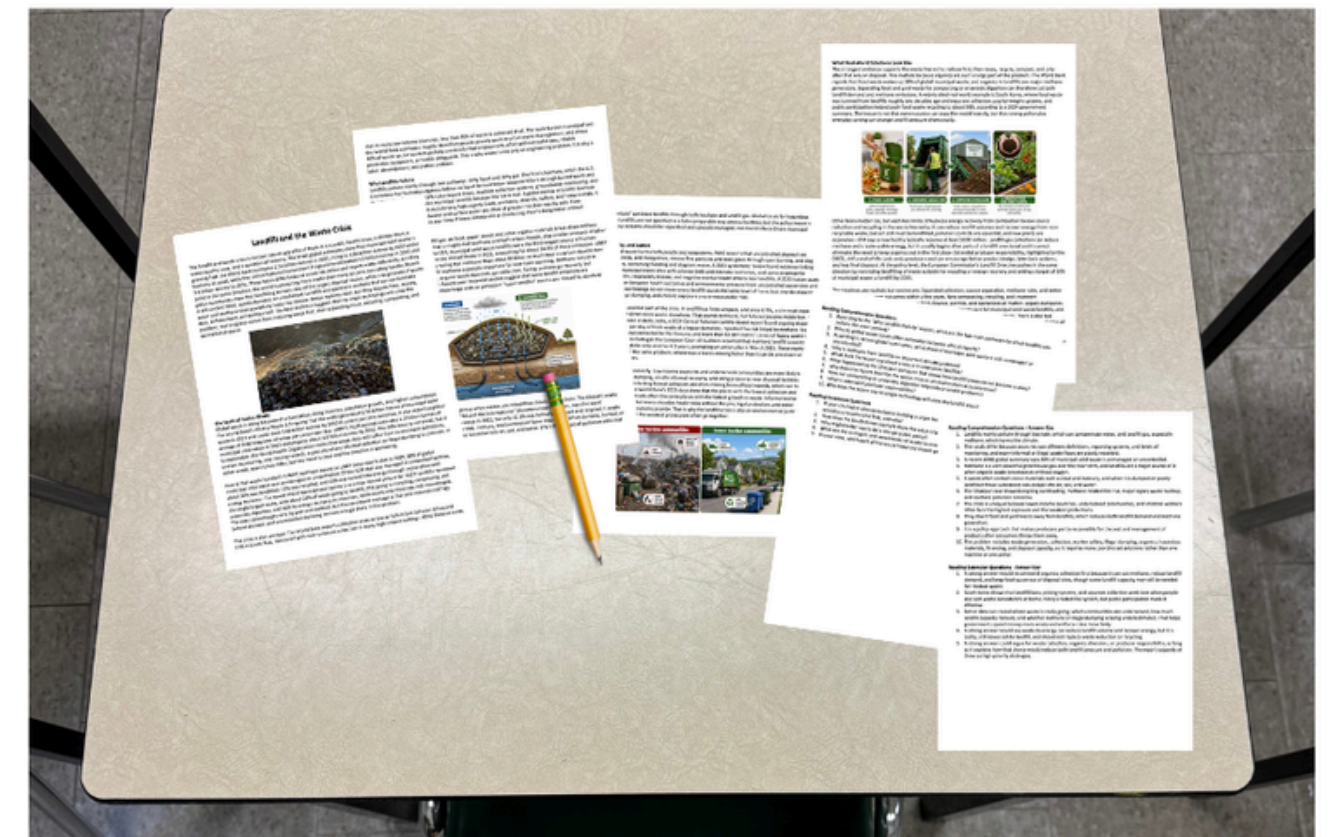


THE PROBLEMS YOU FACE

- **Limited time to teach scientific literacy and strengthen students' reading and analysis skills.**
- **Need meaningful extension activities to engage fast-moving learners.**
- **Difficulty creating effective last-minute sub plans that still support student learning.**

NO-PREP - PRINT/UPLOAD

- **CLASSROOM READY - No Prep, Ready-to-Use:** Print or assign digitally with Google Docs, Microsoft Word, and PDF formats for flexible classroom use
- **Questions and Answer Key**
- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



What Will Your Students Learn?

READING COMPREHENSION ARTICLE & QUESTION BUNDLE

Article with
Comprehension
Questions

Grade 8 and Up

Print & Digital

- What Is the Global Waste Crisis?
- Growth of Municipal Solid Waste
- Waste Collection and Disposal Methods
- Landfills vs. Open Dumping
- Leachate and Water Pollution
- Landfill Gas and Methane Emissions
- Climate Change and Waste Systems
- E-Waste and Hazardous Materials
- Health Impacts of Poor Waste Management
- Landfill Capacity and Urban Challenges
- Environmental Justice and Waste Inequality
- Case Study: Global Waste Trends and Landfill Pressure
- The Waste Hierarchy (Reduce, Reuse, Recycle, Compost)
- Composting and Organic Waste Solutions
- Waste-to-Energy and Its Limitations
- Extended Producer Responsibility (EPR)
- Policy, Technology, and Long-Term Solutions

Reading Comprehension Questions

1. According to the 'Why Landfills Pollute' section, what are the two main pathways by which landfills pollute the environment?
2. Why do global waste totals differ somewhat between official reports?
3. According to recent global summaries, what share of municipal solid waste is still unmanaged or uncontrolled?
4. Why is leachate from landfills an important climate problem?
5. What are some solutions to landfills?
- 6.
- 7.
- 8.
- 9.
- 10.

Landfill and the Waste Crisis

The landfill and waste crisis is not just about ugly piles of trash. It is a public-health issue, a climate issue, a water-quality issue, and a question of fairness. The latest global estimates show that municipal solid waste is growing fast: the World Bank estimates 2.56 billion tonnes in 2022, rising to 3.86 billion tonnes by 2050 under business as usual, while the United Nations Environment Programme estimated 2.3 billion tonnes by 2050 under point in the same direction: the world is producing more waste than many systems can safely handle, but they are still uncontrolled, openly dumped, or uncollected. Landfills also generate leachate that can contaminate water and methane that powerfully heats the climate. Better systems exist, but they require time, money, data, enforcement, and political will. The best evidence suggests that no single technology will solve the problem; real progress comes from reducing waste first, then expanding reuse, recycling, composting, and controlled disposal.



The Scale of Global Waste

Global waste is rising because of urbanization, rising incomes, population growth, and higher consumption. The World Bank's What a Waste 3.0 reports that the world generated 2.56 billion tonnes of municipal solid waste in 2022 and could reach 3.86 billion tonnes by 2050 if current patterns continue. It also reports a global average of 0.88 kilograms of waste per person per day. UNEP's 2024 outlook estimates 2.3 billion tonnes of municipal solid waste in 2023 and projects about 3.8 billion tonnes by 2050. The difference is not trivial, but it is explainable: the World Health Organization notes that waste data still suffer from inconsistent definitions, uneven monitoring, and missing records, especially where informal collection or illegal dumping is common. In other words, exact totals differ, but the trend is clear and the problem is worsening.

Google Access

Thank you for your purchase. Clicking the link below will take you to the Google Drive link where you can find the document. Please make sure you are logged in to your Google account. If you are not logged in, you will be prompted to log in. Once logged in, you will be able to access the document. If you are not logged in, you will be prompted to log in. Once logged in, you will be able to access the document.

Click here to place a copy directly into your Google Drive account.

PDF



Your Reading

Landfill and the Waste Crisis

The landfill and waste crisis is not just about ugly piles of trash. It is a public-health issue, a climate issue, a water-quality issue, and a question of fairness. The latest global estimates show that municipal solid waste is growing fast: the World Bank estimates 2.56 billion tonnes in 2022, rising to 3.86 billion tonnes by 2050 under business as usual, while the United Nations Environment Programme estimated 2.3 billion tonnes in 2023 and 3.8 billion tonnes by 2050. These totals differ because countries define and report waste differently, but they point in the same direction: the world is producing more waste than many systems can safely handle. Recent global summaries show that landfilling remains one of the largest disposal routes, while a large share of waste is still uncontrolled, openly dumped, or uncollected. Landfills also generate leachate that can contaminate water and methane that powerfully heats the climate. Better systems exist, but they require time, money, data, enforcement, and political will. The best evidence suggests that no single technology will solve the problem; real progress comes from reducing waste first, then expanding reuse, recycling, composting, and controlled disposal.



The Scale of Global Waste

Global waste is rising because of urbanization, rising incomes, population growth, and higher consumption. The World Bank's What a Waste 3.0 reports that the world generated 2.56 billion tonnes of municipal solid waste in 2022 and could reach 3.86 billion tonnes by 2050 if current patterns continue. It also reports a global average of 0.88 kilograms of waste per person per day. UNEP's 2024 outlook estimates 2.3 billion tonnes of municipal solid waste in 2023 and projects about 3.8 billion tonnes by 2050. The difference is not trivial, but it is explainable: the World Health Organization notes that waste data still suffer from inconsistent definitions, uneven monitoring, and missing records, especially where informal collection or illegal dumping is common. In other words, exact totals differ, but the trend is clear and the direction is worsening.

How is that waste handled? A WHO synthesis based on UNEP data reports that in 2020, 38% of global municipal solid waste was unmanaged or uncontrolled. Of the 62% that was managed in controlled facilities, about 30% was landfilled, 19% was recycled, and 13% was turned into energy through incineration with energy recovery. The newer World Bank dataset points to a similar overall picture for 2022: landfills remained the single largest route, with about 29% of waste going to landfill, 21% going to recycling, composting, and anaerobic digestion, and 20% to energy-recovery incineration, while nearly one-third was still mismanaged. The exact percentages vary by year and method, but the consistent message is that safe recovery still lags behind disposal, and uncontrolled dumping remains a huge share of the problem.

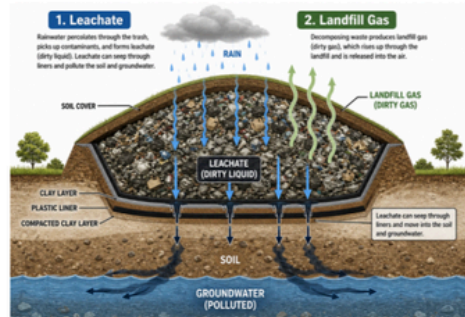
The crisis is also unequal. The World Bank reports collection rates as low as 31% in Sub-Saharan Africa and 67% in South Asia, compared with near-universal collection in many high-income settings. WHO likewise notes

that in many low-income countries, less than 40% of waste is collected at all. The work burden is unequal too: the World Bank estimates roughly 18 million people already work in urban waste management, and about 40% of waste-sector workers globally are in informal employment, often without stable pay, reliable protective equipment, or health safeguards. This is why waste is not only an engineering problem. It is also a labor, development, and justice problem.

Why Landfills Pollute

Landfills pollute mainly through two pathways: dirty liquid and dirty gas. The first is leachate, which the U.S. Environmental Protection Agency defines as liquid formed when rainwater filters through buried waste and draws chemicals out of it. EPA rules require liners, leachate collection systems, groundwater monitoring, and corrective action at regulated municipal landfills because the risk is real. A global review of landfill leachate found that major pollutants include very high organic loads, ammonia, chloride, sulfate, and heavy metals; it also concluded that groundwater and surface water are often at greater risk than nearby soils. Even engineered landfills can leak over time if liners deteriorate or drains clog. Poorly designed or unlined dumpsites are far worse.

The second pathway is landfill gas. As food, paper, wood, and other organic materials break down without oxygen, they generate gas that is roughly half methane and half carbon dioxide, plus smaller amounts of other compounds. According to the EPA, municipal solid waste landfills were the third-largest source of human-related methane emissions in the United States in 2022, accounting for about 14.4% of those emissions. UNEP summarizes IPCC findings by noting that methane traps about 80 times as much heat as carbon dioxide over 20 years, which makes landfill methane especially important for near-term warming. Methane control is possible through daily cover, organic-waste diversion, gas collection, flaring, and energy recovery, but measurement is still difficult. Recent peer-reviewed studies suggest that some landfill emissions are underestimated, especially where large leaks or persistent "super-emitter" events are missed by standard inventories.



Landfills also become more dangerous when wastes are mixed that should not be there. The Global E-waste Monitor 2024, produced by UNITAR and the International Telecommunication Union, says the world generated 62 million tonnes of e-waste in 2022, but only 22.3% was formally collected and recycled. E-waste contains toxic substances such as lead, mercury, and brominated flame retardants. When dumped, burned, or poorly landfilled, those substances can move into air, soil, and water. EPA's PFAS disposal guidance adds that

"forever chemicals" can leave landfills through both leachate and landfill gas. Global totals for hazardous waste sent to landfills are not specified in a fully comparable way across countries, but the policy lesson is clear: hazardous streams should be separated and specially managed, not mixed into ordinary municipal disposal.

Health, Capacity, and Justice

Poorly managed waste harms both people and ecosystems. WHO reports that uncontrolled disposal can attract flies, rodents, and mosquitoes, release fine particles and toxic gases through open burning, and clog drainage systems, worsening flooding and stagnant water. A 2021 systematic review found evidence linking proximity near municipal waste sites with adverse birth and neonatal outcomes, and some evidence for increased mortality, respiratory disease, and negative mental-health effects near landfills. A 2023 Italian study found a correlation between health outcomes and environmental pressure from uncontrolled waste sites and illegal dumps. These findings do not mean every landfill causes the same level of harm, but they do show that weak control, illegal dumping, and chronic exposure create measurable risks.

Landfill capacity is another part of the crisis. A landfill has finite airspace, and once it fills, a city must expand it, build a new site, or divert more waste elsewhere. That sounds technical, but failures become visible fast. At the Ghazipur dumpsite in Delhi, India, a 2024 Central Pollution Control Board report found ongoing disposal of about 1,776 tonnes per day of fresh waste at a legacy dumpsite, repeated fire risk linked to methane, leachate flowing toward a canal connected to the Yamuna, and more than 82 lakh metric tonnes of legacy waste still waiting biomining. In Portugal, the European Court of Auditors reported that mainland landfill capacity in mid-2024 was enough for only another 4.5 years, prompting an action plan in March 2025. These examples show two versions of the same problem: where waste keeps arriving faster than it can be processed or safely contained, crisis follows.

The burdens also fall unevenly. Low-income countries and underserved communities are more likely to face weak collection, open dumping, unsafe informal recovery, and siting pressures near disposal facilities. WHO notes that communities lacking formal collection are often missing from official records, which can hide both exposure and need. The World Bank's 2026 data show that the places with the lowest collection and controlled-disposal rates are often the same places with the fastest growth in waste. Informal workers provide crucial public service, but many shoulder health risks without the pay, legal protection, and social recognition that formal systems provide. That is why the landfill crisis is also an environmental-justice crisis: the worst exposures and the weakest protections often go together.



What Real-World Solutions Look Like

The strongest evidence supports the waste hierarchy: reduce first, then reuse, recycle, compost after that rely on disposal. This matters because organics are such a large part of the problem. T reports that food waste makes up 38% of global municipal waste, and organics in landfills are major generators. Separating food and yard waste for composting or anaerobic digestion can therefore reduce landfill demand and methane emissions. A widely cited real-world example is South Korea, where food waste recycling was banned from landfills roughly two decades ago and separate collection, pay-by-weight systems, and public participation helped push food-waste recycling to about 98%, according to a 2024 government summary. The lesson is not that every country can copy the model exactly, but that strong policies and everyday sorting can change landfill pressure dramatically.



Other tools matter too, but each has limits. EPA places energy recovery from combustion below reduction and recycling in the waste hierarchy: it can reduce landfill volumes and recover energy from recyclable waste, but ash still must be landfilled, pollution controls are essential, and new plants are expensive—EPA says a new facility typically requires at least \$100 million. Landfill-gas collection and methane capture can also help, but it usually begins after parts of a landfill are closed and it eliminates the need to keep organics out in the first place. Extended producer responsibility, high OECD, shifts end-of-life costs onto producers and can encourage better product design, take-back programs, and less final disposal. At the policy level, the European Commission's Landfill Directive restricts landfilling of waste suitable for recycling or energy recovery and limits the amount of municipal waste to landfill by 2035.

The timelines are realistic but not instant. Expanded collection, source separation, methanogenesis, and monitoring can improve outcomes within a few years. New composting, recycling, and treatment infrastructure often takes longer because land, finance, permits, and operations all matter, and it takes longer still. EPA rules require at least 30 years of post-closure care for municipal solid waste landfills. UNEP emphasizes that landfills can keep emitting methane for decades without action. The uncertainty: global waste totals differ across official reports, and WHO warns that poor enforcement, informal systems, and illegal flows make precise comparison difficult. Still, the broad direction is clear: governments and producers reduce waste generation, separate organics and hazardous waste, and protect workers, and treat landfills as a last resort rather than the center of the waste management system. If not, it grows.

Reading Comprehension Questions

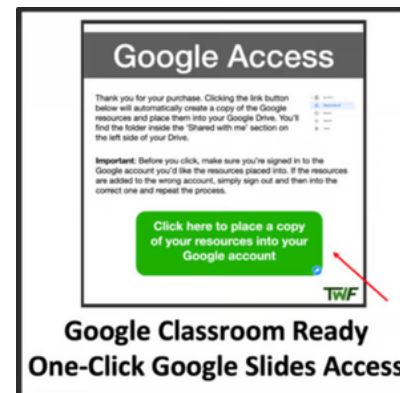
- According to the "Why Landfills Pollute" section, what are the two main pathways by which landfills can pollute the environment?
- Why do global waste totals differ somewhat between official reports?
- According to recent global summaries, what share of municipal solid waste is still unmanaged or uncontrolled?
- Why is methane from landfills an important climate problem?
- What does the report say about e-waste in relation to landfills?
- What happened at the Ghazipur dumpsite that shows how landfill pressure can become a crisis?
- Why does the report describe the waste crisis as an environmental-justice issue?
- How can composting or anaerobic digestion help reduce landfill problems?
- What is extended producer responsibility?
- Why does the report say no single technology will solve the landfill crisis?

Reading Extension Questions

- If your city had to choose between building a larger landfill and investing in organics collection, which would you recommend first, and why?
- How does the South Korea example show the value of policy and public behavior working together?
- Why might better waste data change public policy?
- What are the strengths and weaknesses of waste-to-energy as part of a waste system?
- In your view, which part of the waste hierarchy should get the most attention over the next decade?

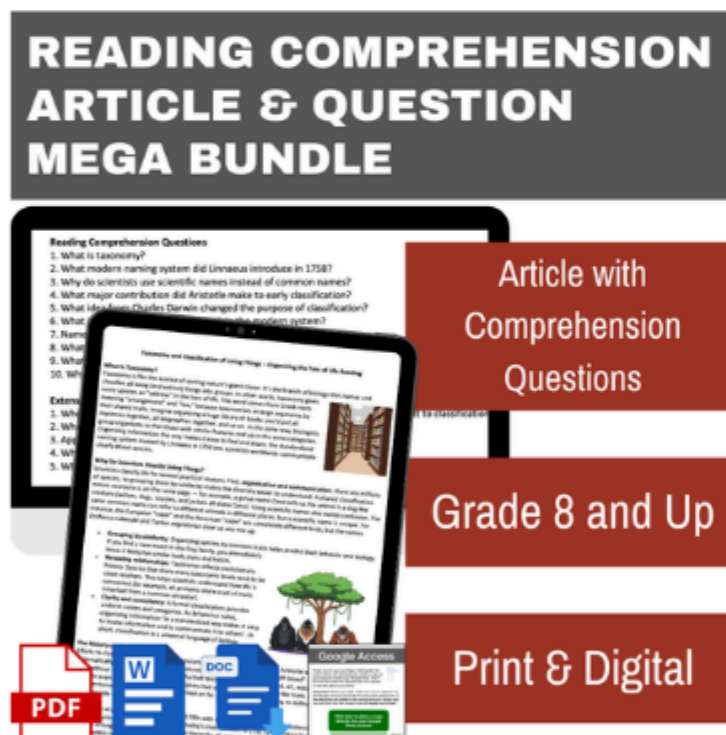
Full Answer Key

Comprehension and Extension Questions



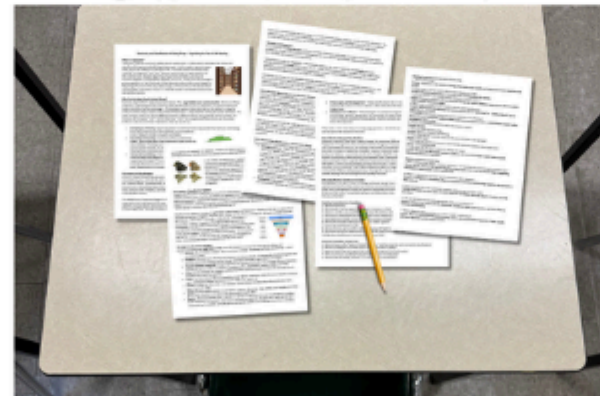
Upgrade to the Grade 8 and Up Reading Mega Bundle

Includes over 130 readings for students in grades 8 and up. The bundle covers all science topics and will save you over 75%.



CLASSROOM READY

- Questions and Answer Key
- **No Prep, Ready-to-Use:** Print or assign digitally with Google Docs, Microsoft Word, and PDF formats for flexible classroom use
- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



★★★★★ Extremely satisfied - It is a good supplemental activity either for review and at the same time introducing some concept. I also use this for sub plan. It is well presented, organized and interesting.

★★★★★ Extremely satisfied - This a great resource. I used this for a sub plan. It was fun and engaging for my students.

Grade 8 and Up Scientific Reading Comprehension Article Mega Bundle

ALL my current and future grade 8 and up readings, covering the following subject areas:

Biology
Chemistry
Earth and Space
Ecology and the Environment
Energy
Health
Natural Disasters
Physics



Improve your students' **Literacy and Analysis Skills**, use as an **Emergency Substitute Plan** or create **Applicability** in your classroom

**Click to
learn more!**

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

I am a real person and if
you have any questions,
suggestions, or concerns,
please reach out.



devon@teachwithfergy.com

TWF

Teach With Fergy

*Let's
Connect!*

