Past-paper walk-through

Solid Waste Disposal ▪ 8.9

eXercise

Questions in this set

- 2023 Set 2 Q3
- 2022 Set 2 Q3
- 2018 Q1
- 2016 Q3
- 2015 Q2

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- // separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.
There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.
Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.
Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.
(a) Describe one environmental problem associated with the release of methane into the atmosphere.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.

There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.

Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.

Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.

(b) Describe one factor that could affect the decomposition of the solid waste in a landfill.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.
There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.
Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.

Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.

(c) Propose a solution to decrease the amount of methane released from landfills into the atmosphere.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.

There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.

Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.

Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.

(d) Justify the solution proposed in part (c) by describing an additional advantage, other than decreasing the amount of methane released from landfills.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.

There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.

Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.

Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.

(e) The average cow releases 150 liters of methane per day. **Calculate** the amount of methane that was released by all beef cattle raised in the United States in 2021. **Show** your work.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.

There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.

Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.

Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.

(f) A typical beef cow needs 11.8 kilograms of food per day, and each hectare of cattle pasture produces 26.2 kilograms of grasses. **Calculate** the number of hectares of

Question 3

pasture that would be needed to support all beef cattle raised in the United States for one day. **Show** your work.

Question 3

2023 Set 2 ▪ Q3

Human activities generate large amounts of solid waste, including organic waste. The decomposition of organic waste in landfills can result in the release of methane into the atmosphere.

There are biological and physical factors that can affect the decomposition of the solid waste in a landfill and the release of methane in the atmosphere.

Another anthropogenic activity that releases methane is raising beef cattle. In 2021, 31.2 million beef cattle were raised in the United States.

Another environmental concern with raising beef cattle for food is that it is not as efficient as growing crops for food.

(g) The average American consumes 2,250 kilocalories of food per day. Beef cattle can produce 2.7 million kilocalories per hectare of land. Corn can produce 30.4 million kilocalories per hectare of land. **Calculate** how many more American people could be

Question 3

fed if 150 hectares of land was used to grow corn instead of raising beef cattle. **Show** your work.

Solution 3

(a)

Mark scheme

- One environmental problem, e.g.: methane traps heat effectively, enhancing the greenhouse effect and leading to climate change/global warming — which can in turn cause melting ice and rising sea levels.

Solution 3

(b)

Mark scheme

- One factor, e.g.: the amount/percentage of organic material in the solid waste; the amount/percentage of non-degradable material in the waste; landfill conditions such as oxygen concentration, population of microbes/decomposers, temperature, or moisture; or environmental conditions of the area such as temperature, rainfall, climate, or weather.

Solution 3

(c)

Mark scheme

- A solution such as: incinerating waste; composting waste; recycling/reusing non-synthetic organic waste (paper, textiles); installing/using methane collection systems; or burning off/combusting the methane coming from the landfill.

Solution 3

(d) Mark scheme

- An additional advantage matching the solution proposed in (c). Incinerating waste: extends the landfill's lifetime, reduces the amount of waste going to the landfill, can be used to generate electricity/heat or income, or reduces land area needed for landfills. Composting waste: extends the landfill's lifetime, produces effective inexpensive fertilizer, or reduces land area needed for landfills. Recycling/reusing organic waste: reduces land needed for landfills, reduces energy/resources needed for new products, or reduces trees cut for new paper. Installing methane collection / burning off methane: can be used to generate electricity, can be used to heat buildings, can generate income, can be used as fuel, or reduces the need for other energy sources.

Solution 3

(e)

Mark scheme

- Setup (1 pt): 150 L methane/day/cow $\times$ 31,200,000 cows (cattle) $\times$ 365 days/year. Calculation (1 pt): 150 $\times$ 31,200,000 $\times$ 365 = 1,708,200,000,000 L (1.7 $\times$ 10^12 L) of methane released by all beef cattle raised in the United States in one year.

Solution 3

(f)

Mark scheme

- Setup (1 pt): (11.8 kg food/day/cow $\div$ 26.2 kg grass produced/ha) $\times$ 31,200,000 cows (cattle). Calculation (1 pt): (11.8/26.2) $\times$ 31,200,000 14,051,908 hectares (1.4 $\times$ 10ˆ7 ha, or 14.1 million hectares) of pasture needed to support all beef cattle raised in the United States for one day.

Solution 3

(g)

Mark scheme

- Setup (1 pt): [(30,400,000 kcal/ha − 2,700,000 kcal/ha) ÷ 2,250 kcal/person] × 150 ha — the extra kcal/ha produced by growing corn instead of raising beef cattle, converted to people fed, for 150 hectares. Calculation (1 pt): (27,700,000/2,250) × 150 = 1,846,667 additional people (1.8 × 10^6) could be fed if 150 hectares were used to grow corn instead of raising beef cattle.

Question 3

2022 Set 2 ▪ Q3

North Carolina is one of the fastest-growing states by population in the United States, with most growth concentrated in major cities like Charlotte. Increased population leads to increased demands for resources such as power and water.

The majority of electrical energy in North Carolina is produced during the combustion of coal.

(a) Identify one negative human health effect linked to the exposure to pollutants resulting from the combustion of coal.

Question 3

2022 Set 2 ▪ Q3

North Carolina is one of the fastest-growing states by population in the United States, with most growth concentrated in major cities like Charlotte. Increased population leads to increased demands for resources such as power and water.

The majority of electrical energy in North Carolina is produced during the combustion of coal.

(b)(i) Coal ash, the powdery, solid substance that remains after coal combustion, presents a variety of potential environmental issues. Disposal of toxic coal ash is a growing concern in the state. Coal ash can be mixed with water and disposed of in large, unlined pits or as dry ash in landfills.

Describe an environmental problem associated with coal ash waste disposal.

(b)(ii) A proposed solution is to dispose of North Carolina's coal ash in clay-lined pits. **Justify** this solution by providing one advantage of using clay soil.

Question 3

2022 Set 2 ▪ Q3

North Carolina is one of the fastest-growing states by population in the United States, with most growth concentrated in major cities like Charlotte. Increased population leads to increased demands for resources such as power and water.
The majority of electrical energy in North Carolina is produced during the combustion of coal.

(c)(i) The population of Charlotte, North Carolina, has grown over the last few decades. The table shows the increase in the population size of Charlotte from 2013 to 2019.

Population of Charlotte, North Carolina, 2013–2019

Year	Population
2013	757,278
2014	774,807
2015	792,137
2016	808,834
2017	826,060
2018	841,611
2019	857,425

Question 3

Calculate the percent change in Charlotte's population from 2013 to 2019. **Show** your work.
(c)(ii) Based on Charlotte's 2019 growth rate of 1.88%, **calculate** the year when the population of Charlotte will double, assuming the growth rate stays the same. **Show** your work.
(c)(iii) The average Charlotte resident uses 90 gallons of water per day. **Calculate** the gallons of water used by the population of Charlotte in the year 2018. **Show** your work.

Question 3

2022 Set 2 ▪ Q3

North Carolina is one of the fastest-growing states by population in the United States, with most growth concentrated in major cities like Charlotte. Increased population leads to increased demands for resources such as power and water.

The majority of electrical energy in North Carolina is produced during the combustion of coal.

(d) Drought periods are becoming more frequent in North Carolina, causing water resources to become more scarce. **Describe** one realistic action that citizens could take to reduce domestic outdoor water use.

Solution 3

(a)

Mark scheme

- Any one negative human health effect linked to pollutant exposure from coal combustion: lung/respiratory disease (asthma, COPD, bronchitis, lung cancer); neurological damage; birth defects; heart disease; eye irritation/respiratory irritation/headaches.

Solution 3

(b)(i)

Mark scheme

- Any one environmental problem associated with coal ash waste disposal: leaching from landfills/clay-lined pits; overflowing of coal ash into bodies of water; leaking and contamination of groundwater, soil, or nearby bodies of water; coal ash washing into bodies of water during severe weather events; dry ash blowing/carrying into nearby bodies of water, increasing turbidity/decreasing photosynthesis.

Solution 3

(b)(ii)

Mark scheme

- Clay is less permeable than unlined pits and can prevent the leaching of coal ash into soil/groundwater.

Solution 3

(c)(i)

Mark scheme

- Percent change = [(857,425 people − 757,278 people) / 757,278 people] $\times$ 100, equivalently [(857,425/757,278) − 1] $\times$ 100. One point for this correct setup; one point for the correct result: 13% (13.22%, or 13.224602%).

(c)(ii)

Mark scheme

- Doubling time = 70 / growth rate(%) = 70 / 1.88 37 years. One point for this correct setup. Adding 37 years to 2019 gives the doubling year: one point for the correct result, 2056.

Solution 3

(c)(iii)

Mark scheme

- Gallons used in 2018 $=$ 90 gallons/person/day $\times$ 841,611 people $\times$ 365 days. One point for this correct setup. One point for the correct result: 27,646,921,350 gallons (accept 2.76$\times$10^10, 2.8$\times$10^10, or 3$\times$10^10 gallons).

Solution 3

(d)

Mark scheme

- Any one realistic action to reduce domestic outdoor water use: plant drought-resistant species/use artificial landscaping/xeriscaping to reduce irrigation needs; eliminate/reduce nonessential water use such as washing cars or power washing; reduce sprinkler/irrigation use by monitoring soil/weather conditions or reducing frequency; collect rainwater or greywater for irrigation; water plants/lawn before sunrise/after sunset to limit evaporation; switch to drip irrigation to limit evaporation.

Question 1

2018 ▪ Q1

Read the following article from the *Fremont Daily Times* and answer the questions that follow.

[Newspaper article, masthead “Fremont Daily Times”, dated May 1, 2018, headline “GREEN IS THE NEW SCHOOL COLOR AT FREMONT HIGH SCHOOL!”]

A group of students from Fremont High School addressed the city council last night and proposed that one of the existing buildings at Fremont High School, which was built in 1970, be renovated to take advantage of recent advances in green technology. Currently the heat for the school is provided by fossil fuel combustion. The students said that the redesigned building would reduce the school’s carbon footprint, which is a measure of the amount of carbon dioxide and other carbon compounds released by various human activities. Incorporating specific features that conserve energy and utilize renewable energy sources can help reduce the carbon footprint.

Question 1

Councilperson Gail Fassler praised the idea, saying that the project could conserve local water resources, reduce the need for consuming new resources, and act as a “shining beacon” of sustainability for the greater Fremont community. Fassler suggested the project could even incorporate a living green roof as an additional sustainable feature. The council approved the initial site planning request and urged students to report back when the project was under way.

(a)(i) Define carbon footprint.

(a)(ii) Identify one way the school’s heating system is likely adding to the school’s carbon footprint.

(a)(iii) Describe one realistic way to reduce the contribution of the heating system to the school’s carbon footprint.

(b) Identify TWO environmental benefits of a living green roof, such as that suggested by Councilperson Fassler.

Question 1

(c) Describe TWO practices the cafeteria's food service could use to decrease the environmental impacts of Fremont High School.
(d) Discuss TWO benefits of using native plants for landscaping at Fremont High School.
(e) During the renovation, the carpeting must be replaced. Discuss one environmental benefit of using flooring made of plant material, such as cork or bamboo, instead of carpet made of synthetic fibers.

Question 1

Fremont Daily Times May 1, 2018

GREEN IS THE NEW SCHOOL COLOR AT FREMONT HIGH SCHOOL!

A group of students from Fremont High School addressed the city council last night and proposed that one of the existing buildings at Fremont High School, which was built in 1970, be renovated to take advantage of recent advances in green technology. Currently the heat for the school is provided by fossil fuel combustion. The students said that the redesigned building would reduce the school's carbon footprint, which is a measure of the amount of carbon dioxide and other carbon compounds released by various human activities. Incorporating specific features that conserve energy and utilize renewable energy sources can help reduce the carbon footprint.

Councilperson Gail Fassler praised the idea, saying that the project could conserve local water resources, reduce the need for consuming new resources, and act as a "shining beacon" of sustainability for the greater Fremont community. Fassler suggested the project could even incorporate a living green roof as an additional sustainable feature. The council approved the initial site planning request and urged students to report back when the project was under way.

Solution 1

(a)(i)

Mark scheme

- 1 point for a correct definition of carbon footprint. Carbon footprint = the amount of carbon dioxide and/or other carbon compounds released to the environment by a product, process, or activity (a measurement of the amount of carbon released by human activities).

Solution 1

(a)(ii)

Mark scheme

- 1 point for correctly identifying a way the heating system adds to the carbon footprint. Accept: the burning/combustion of fossil fuels releases carbon dioxide; OR incomplete combustion of fossil fuels releases carbon monoxide.

Solution 1

(a)(iii)

Mark scheme

- 1 point for a correct description of a realistic way to reduce the heating system's contribution. Accept any one of: switch to renewables (solar, wind) or a more efficient fossil fuel (natural gas, propane) or a provider using nuclear energy; decrease the thermostat/program it to lower energy use at certain times; purchase carbon-offset credits through environmental agencies; increase insulation or other efficiency/design methods (green roof, double-paned glass, south-facing windows for passive solar heating, change air filters, etc.).

Solution 1

(b)

Mark scheme

- 2 points, 1 point per correct identification of an environmental benefit of a green roof (up to 2). Accept any two of: insulation/reduced fossil fuel use for heating and/or cooling; habitat for wildlife/plants, increases biodiversity; area to grow crops/local food production; reduction in urban heat islands; photosynthesis/carbon capture/CO2 storage/oxygen release; stormwater treatment/runoff reduction; filters particulates, VOCs, O3 from air.

Solution 1

(c) Mark scheme

- 2 points, 1 point per correct description of a practice that decreases the school's environmental impact (up to 2). Accept any two of: offer more vegetarian options/serve fewer animal products; use locally sourced food to reduce transportation; grow food at school; compost food waste; donate leftover food; use energy-friendly practices (LED lighting, more cold-cut sandwiches) to reduce energy use; purchase bulk packaged items; use recyclable containers/avoid disposable straws-trays; install a water fountain/stop selling single-serving bottled water; use reusable take-out containers/offer credit for reuse; allow students to choose appropriate portions to reduce food waste; purchase organic foods to reduce pesticide use; use gray water to irrigate landscaping.

Solution 1

(d)

Mark scheme

- 2 points, 1 point per correct discussion of a benefit of native plants (up to 2). Accept any two of: native plants need less pesticide/fertilizer/irrigation water because they are adapted to the local environment; increase biodiversity by providing native habitat; support native food webs/food production; reduce land available for invasive species to establish/spread; save the school money by needing less water/fertilizer/pesticide/upkeep.

Solution 1

(e) Mark scheme

- 1 point for a correct discussion of a benefit of plant-based flooring (e.g. cork, bamboo) over synthetic carpet. Accept any one of: plant-based material is more easily compostable/biodegradable/reusable, unlike carpet; it comes from a renewable resource, making it more sustainable than carpet; it is a carbon sink/reservoir (growing the plant material removes CO2 from the atmosphere), unlike carpet; it requires fewer fossil fuels/toxic chemicals to produce than synthetic carpet fibers; it produces fewer indoor pollutants (off-gassed VOCs/toxins) than carpet; it harbors fewer pathogenic vectors/diseases/allergens (fleas, ticks, dust mites, mold spores) than carpet; when cultivated it provides habitat for native species.

Question 3

2016 ▪ Q3

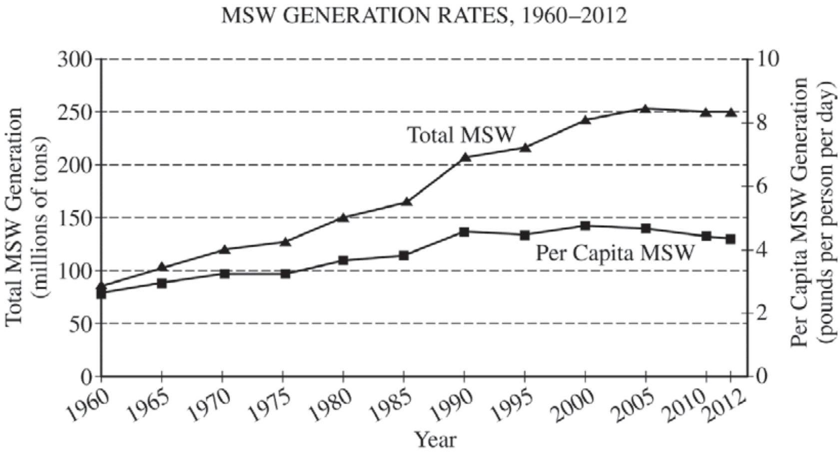
Municipal solid waste (MSW) is the trash collected from households and businesses. The graph below shows MSW generation in the United States from 1960 to 2012. [Line graph titled “MSW GENERATION RATES, 1960-2012”. Left y-axis: “Total MSW Generation (millions of tons)”, scale 0 to 300 in increments of 50. Right y-axis: “Per Capita MSW Generation (pounds per person per day)”, scale 0 to 10 in increments of 2. X-axis: “Year”, from 1960 to 2012 in 5-year increments (1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2012).
Line labeled “Total MSW” (triangles), approximate values: 1960 80, 1965 105, 1970 120, 1975 128, 1980 150, 1985 165, 1990 205, 1995 215, 2000 240, 2005 252, 2010 250, 2012 250.

Question 3

Line labeled “Per Capita MSW” (squares), approximate values: 1960 2.6, 1965 2.8, 1970 3.2, 1975 3.2, 1980 3.6, 1985 3.7, 1990 4.5, 1995 4.4, 2000 4.7, 2005 4.6, 2010 4.4, 2012 4.2.]

(a)(i) Use the data provided in the graph above to respond to the following.
Explain one probable cause (other than increased composting) for the change in per capita waste generation from 2000 to 2012.
(a)(ii) Calculate the percent increase in total MSW generation from 1980 to 2012.

Question 3



MSW GENERATION RATES, 1960–2012
Total MSW Generation (millions of tons)
Per Capita MSW Generation (pounds per person per day)
300
250
200
150
100
50
0
10
8
6
4
2
0
Total MSW
Per Capita MSW
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2012
Year

Question 3

2016 ▪ Q3

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Question 3

(b)(i) Two ways of managing MSW are incineration and disposal in landfills. **Identify** one disadvantage of waste incineration.
(b)(ii) Identify one disadvantage of waste disposal in landfills.

Question 3

2016 ▪ Q3

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Question 3

(c) Trash incineration is one way to generate electricity from MSW. Electricity can also be generated from waste buried in landfills.
Describe the specific steps of a process used to produce electricity from waste buried in a landfill.

Question 3

2016 ▪ Q3

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Question 3

(d) Many landfills do not accept used tires. As a result, the tires are often dumped in poorly regulated piles. **Describe** one human health problem associated with piles of discarded tires.

Question 3

2016 ▪ Q3

Municipal solid waste (MSW) is the trash collected from households and businesses. The graph below shows MSW generation in the United States from 1960 to 2012.
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Question 3

(e)(i) Composting is one way to reduce the amount of waste that enters a landfill. Other than reducing the volume of waste, **identify** one advantage of composting.
(e)(ii) Identify one disadvantage of composting.

Solution 3

(a)(i)

Mark scheme

- 1 point for a correct explanation (other than increased composting) for the change in per capita waste generation from 2000 to 2012: people/businesses practicing refuse, reduce, reuse, recycle, or repurpose; lighter materials contribute to less MSW (e.g., plastic bottles instead of glass); less material used per product (e.g., thinner newspapers, lighter aluminum cans); technology reduces waste generation (e.g., reading magazines online instead of on paper); or economic recession leading to less consumption and less MSW produced.

Solution 3

(a)(ii)

Mark scheme

- 1 point for the correct answer with work shown: ((250 million tons – 150 million tons) / 150 million tons) $\times$ 100 = 66% to 67% increase in total MSW generation from 1980 to 2012.

Solution 3

(b)(i)

Mark scheme

- 1 point for a correct identification of a disadvantage of waste incineration: releases a specific air pollutant (e.g., CO, CO2, dioxin, halogens, particulates, SOx, NOx); ash disposal is necessary; incinerators are expensive to construct and/or operate; MSW supply/quality may be limited, requiring additional fuel; or reduced quality of life and property value due to the incinerator and supply trucks.

Solution 3

(b)(ii)

Mark scheme

- 1 point for a correct identification of a disadvantage of waste disposal in landfills: groundwater, surface water, or soil contamination through some transport mechanism; reduced quality of life and property value due to the landfill and supply trucks; release of methane or CO2; odor source; attracts vermin; habitat destruction; precludes other land uses; or explosion/seepage hazard from methane produced.

Solution 3

(c)

Mark scheme

- 3 points, 1 point for each correct step in the process of generating electricity from landfill gas: (1) Acquire fuel (chemical energy) — methane is collected/gathered from the landfill; (2) Use fuel (chemical $\rightarrow$ mechanical) — the fuel is combusted to produce steam or hot air; (3) Generate electricity (mechanical $\rightarrow$ electricity) — the steam or hot air spins/turns/rotates a turbine/generator to generate/produce electricity.

Solution 3

(d)

Mark scheme

- 1 point for a correct description of a human health problem associated with piles of discarded tires: discarded tires provide standing-water habitat for mosquitoes/pests that can act as disease vectors; or tires may catch fire and release air pollutants that cause respiratory issues in humans.

Solution 3

(e)(i)

Mark scheme

- 1 point for a correct identification of an advantage of composting (other than reducing waste volume): the resulting compost can be used or sold as fertilizer or soil amendment; municipal composting facilities may provide jobs; MSW may emit less foul odor if organic material is composted; or tipping fees and trash removal costs may be reduced by removing dense compostable material.

Solution 3

(e)(ii)

Mark scheme

- 1 point for a correct identification of a disadvantage of composting: compost may attract undesirable animals (vermin); compost may emit foul odors or spontaneously combust; nutrients released from decomposing organic matter may run off into surface waters and cause water quality problems; compost may release methane; or composting organic material requires a great investment of time and labor by humans.

Question 2

2015 ▪ Q2

Approximately 30 million mobile devices were sold in 1998 in the United States. The number sold increased to 180 million devices in 2007.

(a) Calculate the percent increase of mobile device sales from 1998 to 2007.

Question 2

2015 ▪ Q2

Approximately 30 million mobile devices were sold in 1998 in the United States. The number sold increased to 180 million devices in 2007.

(b) Each mobile device sold in 2007 contained an average of 0.03 gram of gold. Calculate the number of grams of gold that were used in the production of the mobile devices sold in 2007.

Question 2

2015 ▪ Q2

Approximately 30 million mobile devices were sold in 1998 in the United States. The number sold increased to 180 million devices in 2007.

(c) Assume that the average mass of each mobile device was 0.1 kilogram. The United States Environmental Protection Agency estimates that about 10 percent of the mobile devices sold in 2007 were recycled. Calculate the mass (in kilograms) of the mobile devices sold in 2007 that were not recycled.

Question 2

2015 ▪ Q2

Approximately 30 million mobile devices were sold in 1998 in the United States. The number sold increased to 180 million devices in 2007.

(d) Discarded mobile devices become part of the electronic waste stream (e-waste). Mercury is often present in e-waste. Identify one negative human health effect, other than death, associated with exposure to mercury.

Question 2

2015 ▪ Q2

Approximately 30 million mobile devices were sold in 1998 in the United States. The number sold increased to 180 million devices in 2007.

(e) Improper disposal of e-waste has harmed human health and caused environmental damage in developing countries.

(e)(i) State TWO reasons why large quantities of e-waste from the United States are shipped to developing countries rather than being recycled in the United States.

(e)(ii) Retailers or manufacturers could take specific steps to dramatically reduce the amount of e-waste. Describe a realistic change in current practices that would accomplish this.