

0 3

This question is about pollutants.

0 3 . 1

Waste water has harmful substances removed before being released into the environment.

Complete the sentences.

[2 marks]

Agricultural waste water requires the removal of harmful

_____.

Industrial waste water may require the removal of harmful

_____.

0 3 . 2

How is sewage sludge treated before being released into the environment?

[1 mark]Tick (✓) **one** box.

Aerobic biological treatment

Anaerobic digestion

Grit removal

Screening



0 3 . 3

Hydrocarbons are used to make polymers. Polymers are used to make plastic bags.

In one year 8.0 billion plastic bags were used.

The next year there was a charge for plastic bags and only 1.3 billion plastic bags were used.

Calculate the percentage decrease in the number of plastic bags used.

[3 marks]

Percentage decrease = _____ %

Question 3 continues on the next page

Turn over ►



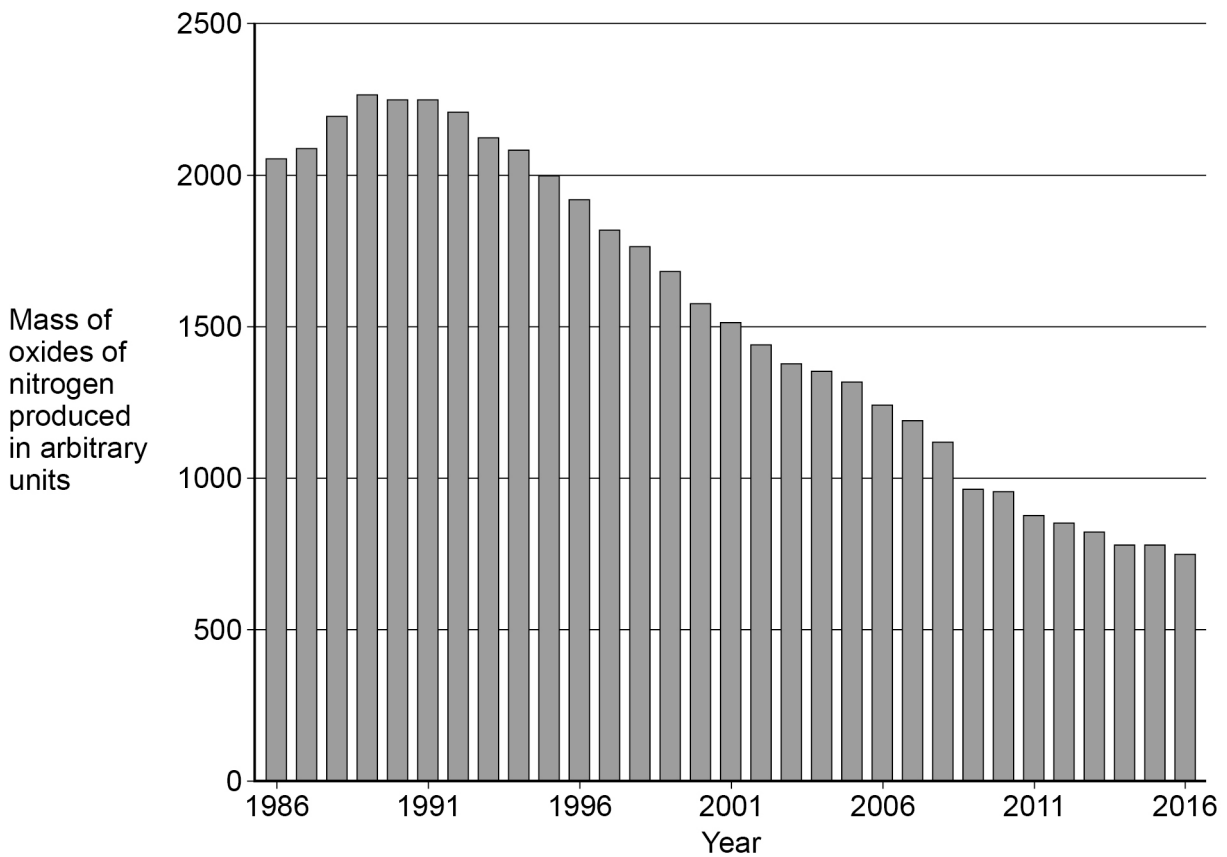
Oxides of nitrogen are pollutants formed in car engines.

0 3 . 4 Give **one** problem oxides of nitrogen cause.

[1 mark]

0 3 . 5 **Figure 3** shows the mass of oxides of nitrogen produced from car engines from 1986 to 2016.

Figure 3



Suggest why the mass of oxides of nitrogen produced from car engines increased and then decreased.

[2 marks]

Increased _____

Decreased _____

9



Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	microbes	allow bacteria / pathogens	1	AO1 5.10.1.3
	chemicals		1	
03.2	anaerobic digestion		1	AO1 5.10.1.3
03.3	(decrease =) 6.7 (billion)		1	AO2 5.10.2.2
	(% decrease =) $\frac{6.7}{8.0} \times 100$	allow correct use of an incorrect value for decrease in plastic bag use	1	
	= 84 (%)	allow 83.75 / 83.8 (%)	1	
	alternative approach: (% now used =) $\frac{1.3}{8.0} \times 100$ (1) = 16.25 (1)			
	(% decrease =) 84 (%) (1)	allow 83.75 / 83.8 (%)		

<p>03.4</p>	<p>respiratory problems</p> <p>or</p> <p>acid rain</p>	<p>allow named respiratory conditions eg asthma allow breathing problems</p> <p>allow consequences of acid rain eg kills aquatic life or damages limestone buildings</p> <p>allow smog</p>	<p>1</p>	<p>AO1 5.9.3.2</p>
<p>03.5</p>	<p>(increased) more traffic</p> <p>(decreased) improved efficiency of car engines</p>	<p>allow more cars</p> <p>allow use of catalytic converters allow more electric / hybrid cars allow lower temperature of car engines allow more use of public transport allow more people walk / cycle</p> <p>ignore better designed engines</p>	<p>1</p> <p>1</p>	<p>AO3 5.9.3.1</p>
<p>Total</p>			<p>9</p>	