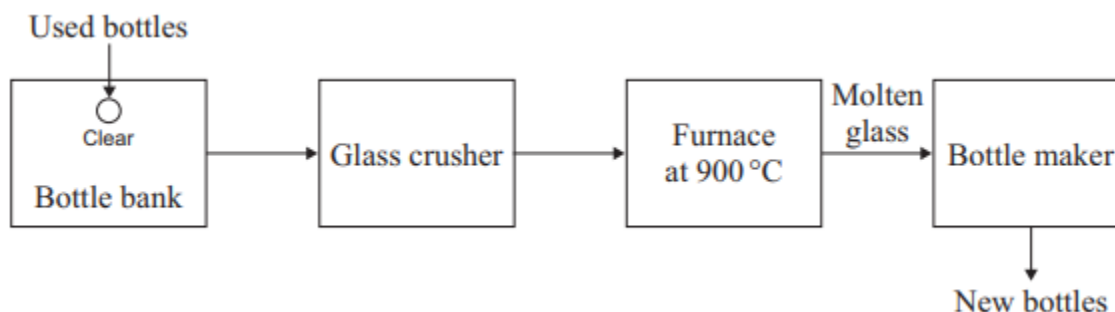


# REUSE & RECYCLING 1

**Q1.** In recent years we have become more aware of the need to recycle glass.

**(a)** Used glass bottles can be recycled if they are put into bottle banks.



**(i)** Suggest one reason why light bulbs should not be put into bottle banks.

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(1 mark)

**(ii)** Very few glass bottles are reused (used more than once). Suggest one reason why.

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(1 mark)

**(iii)** New glass bottles can also be produced by heating, at 1700°C, a mixture of the following raw materials:

- sand (silicon dioxide),  $\text{SiO}_2$
- soda ash (sodium carbonate),  $\text{Na}_2\text{CO}_3$
- limestone (calcium carbonate),  $\text{CaCO}_3$

Explain why the use of recycled glass to make glass bottles produces less carbon dioxide than making glass bottles from these raw materials.

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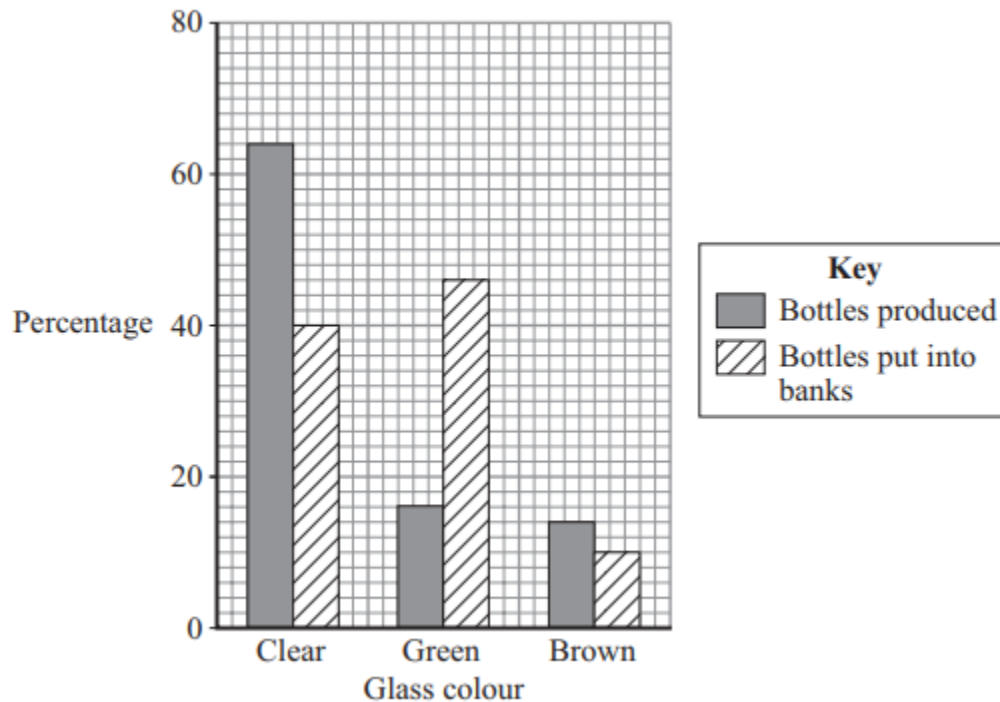
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(2 marks)

**(b)** The bar chart shows the percentages of glass bottles produced and the percentages of glass bottles put into bottle banks in the UK.



**(i)** The percentage of green glass bottles produced is 16%. What is the percentage of green glass bottles put into bottle banks?

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(1 mark)

**(ii)** More green glass bottles are put into bottle banks than are made in the UK. Suggest one reason why.

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(1 mark)

**(iii)** Suggest and explain one problem resulting from the percentage of clear glass bottles produced in the UK.

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(2 marks)

**Q2.** Aluminium is the most abundant metal in the Earth's crust. Suggest two reasons why we should recycle aluminium drinks cans.

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(2 marks)

**Q3.** Supermarkets in the UK have been advised by the Government to stop giving plastic bags to customers. The Government states that this is because plastic bags use up resources that are not renewable and that the manufacture of plastic bags produces carbon dioxide. Most of these plastic bags are made from poly(ethene). The table shows methods to deal with large numbers of used plastic bags.

<b>Method</b>	<b>Description of what happens to the plastic bag</b>
Reused	used again by the customer
Recycled	collected, transported, washed and melted to make new plastic items
Burned	collected, transported and burnt to release heat energy
Dumped	mixed with other household waste, collected, transported and disposed of at a landfill site

Use the information and your knowledge and understanding to briefly give one advantage and one disadvantage for each of these methods.

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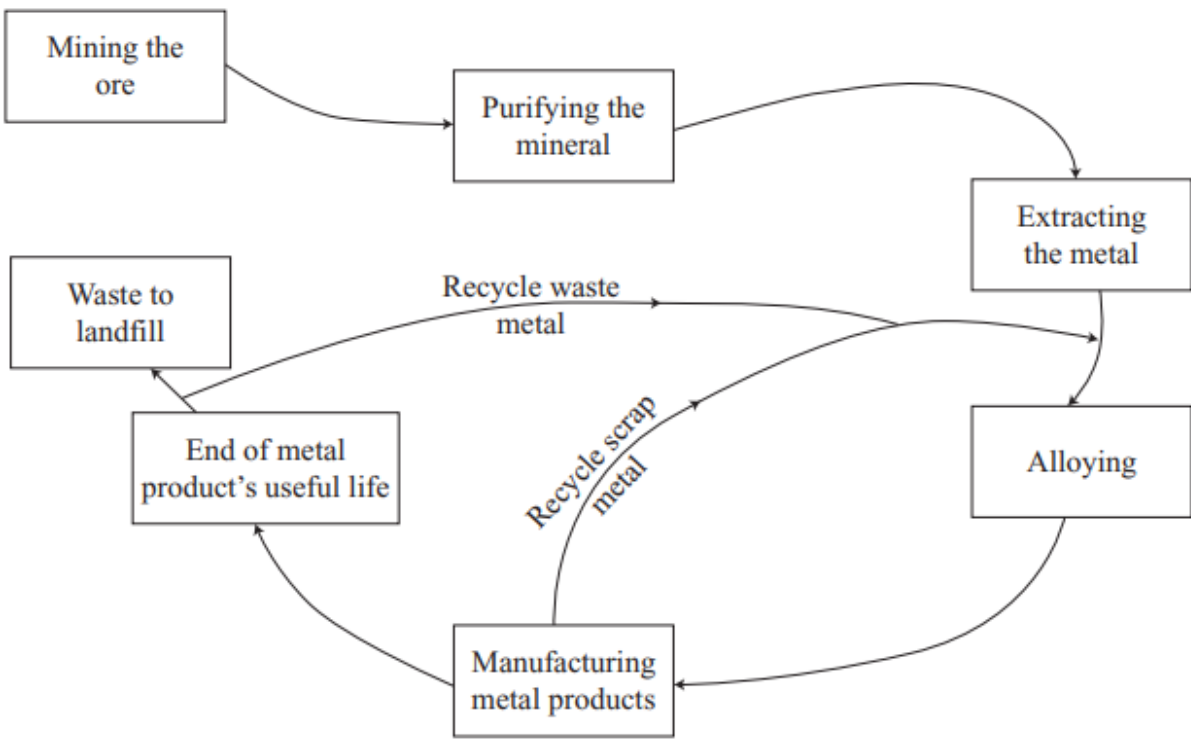
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(4 marks)

**Q4.** The diagram shows the way in which iron is extracted, used and recycled.



Explain why the recycling of iron is necessary for sustainable development.

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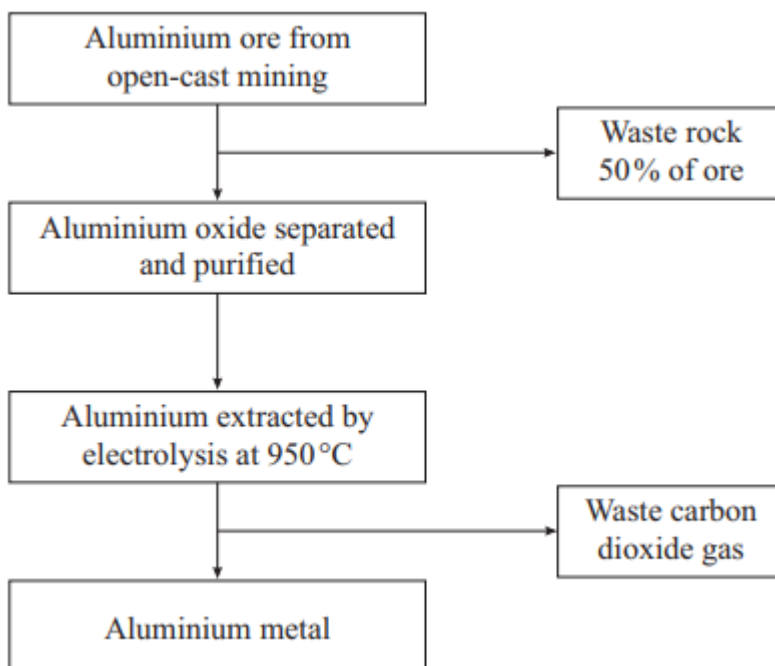
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(3 marks)

**Q5.** Aluminium has many uses because of its low density, good electrical conductivity, flexibility and resistance to corrosion.

The main steps in the extraction of aluminium are shown in the flow chart.



Use the information in the flow chart to suggest the benefits of recycling aluminium.

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**Q6.** Read the following information.

**Landfill, Incineration, Recycling and Re-use of Poly(ethene)**

People could be encouraged to re-use their poly(ethene) bags and containers.

Recycling poly(ethene) saves raw materials and energy needed to make new plastic. When polymers are recycled the plastics must be collected, transported, sorted into different types by hand and washed. This requires the use of fossil fuels and is expensive.

Poly(ethene) can be burnt in an incinerator with other household waste. The heat released could be used to make steam to drive an electric generator. Surplus heat could be used to heat greenhouses used for growing vegetables. Incineration at too low a temperature can produce harmful substances. The residue (ash) has to go to landfill.

Landfill is probably the easiest way to dispose of polymers and it is cheap. Polymers are often mixed in with other household rubbish. Household waste does not get sorted into different materials because it is disposed of in the same hole in the ground. When the hole is eventually full, the waste is covered by a layer of soil to stop it smelling. The waste gets compressed under its own weight. Most polymers, such as poly(ethene), are not biodegradable so will remain in the ground forever.

You are asked to decide which option for the disposal of poly(ethene) will be put forward in your area. You decide that recycling is the best option.

Suggest one economic argument and one environmental argument that will be made against recycling.

For each argument made, how will you persuade those making the argument to accept your option? (You must use only one sentence for each argument made against your decision and only one sentence for your response to it.)

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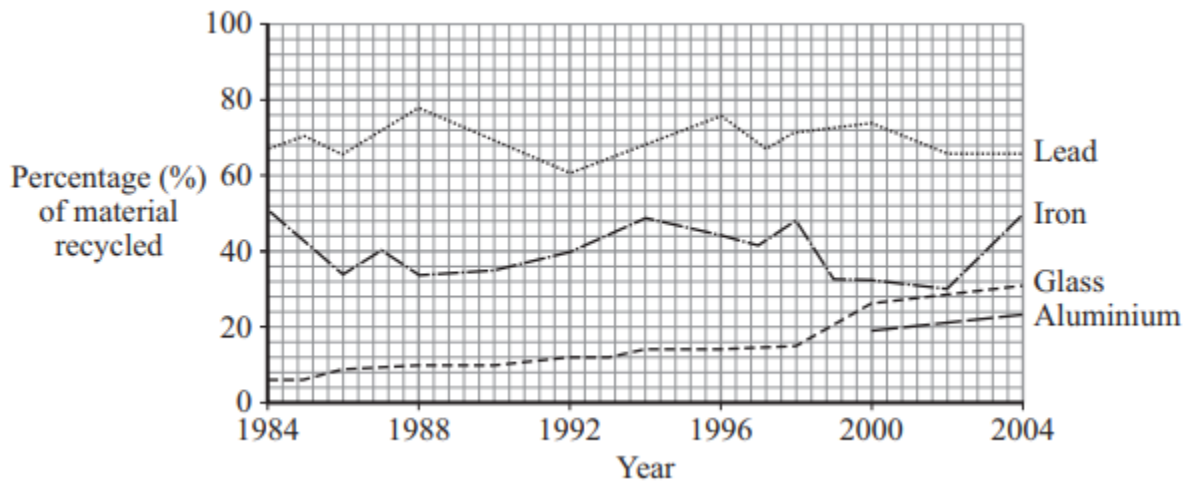
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(4 marks)

**Q7.** The graph shows the percentages of aluminium, glass, iron and lead that have been recycled in the UK between 1984 and 2004.



Match materials, A, B, C and D, with the numbers 1– 4 in the sentences.

- A aluminium
- B glass

C iron

D lead

The material that has the highest percentage recycled is . . . 1 . . . .

Before 2000, there is no data for . . . 2 . . . .

Since 1984, there has been an increase in the percentage of . . . 3 . . . recycled.

Since 2002, there has been a steep increase in the percentage of . . . 4 . . . recycled.

(4 marks)

**Q8.** Recycling of plastic bottles increased between 1994 and 2005.

<b>Year</b>	<b>Tonnes of plastic bottles recycled</b>
1994	2 000
1995	4 000
1996	5 000
1997	6 000
1998	9 000
1999	10 000
2000	11 000
2001	13 000
2002	18 000
2003	25 000
2004	38 000
2005	63 000



**(a)** If the rate of recycling plastic bottles continued to follow this trend, the quantity recycled in 2006 would have been . . .

- 1 70 000 tonnes.
- 2 99 000 tonnes.
- 3 200 000 tonnes.
- 4 350 000 tonnes.

(1 mark)

**(b)** Between which two years was there the greatest percentage growth in recycling plastic bottles?

- 1 1994 to 1995
- 2 1999 to 2000
- 3 2002 to 2003
- 4 2004 to 2005

(1 mark)

**(c)** The data in the table on page 24, could be presented as a bar chart. Which row of the table below gives the correct data types for tonnes of plastic bottles and the year?

	<b>Tonnes of plastic bottles</b>	<b>Year</b>
<b>1</b>	Continuous	Categoric
<b>2</b>	Discrete	Continuous
<b>3</b>	Categoric	Continuous
<b>4</b>	Continuous	Discrete

(1 mark)

**(d)** The government should encourage the recycling of plastic bottles because . . .

- 1 there is an unlimited supply of the raw material.
- 2 landfill sites cannot take plastic bottles.
- 3 plastic bottles are made from a non-renewable raw material.
- 4 plastic bottles may decompose after use.

(1 mark)

Total marks (32)