



100% sheet

Year 11

Using Earth's resources

Sterilising agents include chlorine, ozone and UV light.

Potable water	<i>Water of an appropriate quality is essential for life</i>	Human drinking water should have low levels of dissolved salts and microbes. This is called potable water.
UK water	<i>Rain provides water with low levels of dissolved substances</i>	This water collects in the ground/lakes/rivers. To make potable water an appropriate source is chosen, which is then passed through filter beds and then sterilised.
Desalination	<i>Needs to occur is fresh water is limited and salty/sea water is needed for drinking</i>	This can be achieved by distillation or by using large membranes e.g. reverse osmosis. These processes require large amounts of energy.

Earth's resources	<i>Used to provide warmth, shelter, food and transport for humans</i>	Natural resources and resources from agriculture provide: timber, food, clothing and fuels. Finite resources from the Earth, oceans and atmosphere are processed to provide energy and materials.
Chemistry and resources	<i>Research and techniques improve agricultural and industrial processes</i>	These improvements provide new products and improve sustainability.
Plastics	<i>Normally made using ethene from crude oil</i>	However, the raw material ethene can also be obtained from ethanol, which can be produced during fermentation. Industries are now starting to use a renewable crop for this process.

Using the Earth's resources and sustainable development

Using the Earth's resources and obtaining potable water

AQA GCSE Using resources 1

Life cycle assessment and recycling

Ways of reducing the use of resources

Waste water treatment

Alternative methods of extracting metals (HT)

Waste water	<i>Produced from urban lifestyles and industrial processes</i>	These require treatment before used in the environment. Sewage needs the organic matter and harmful microbes removed.
Sewage treatment	<i>Includes many stages</i>	<ul style="list-style-type: none"> - Screening and grit removal - Sedimentation to produce sludge and effluent (liquid waste or sewage). - Anaerobic digestion of sludge - Aerobic biological treatment of effluent.

LCAS	<i>Life cycle assessments are carried out to assess the environmental impact of products</i>	They are assessed at these stages: <ul style="list-style-type: none"> - Extraction and processing raw materials - Manufacturing and packaging - Use and operation during lifetime - Disposal
Values	<i>Allocating numerical values to pollutant effects is difficult</i>	Value judgments are allocated to the effects of pollutants so LCA is not a purely objective process.

Life cycle assessment

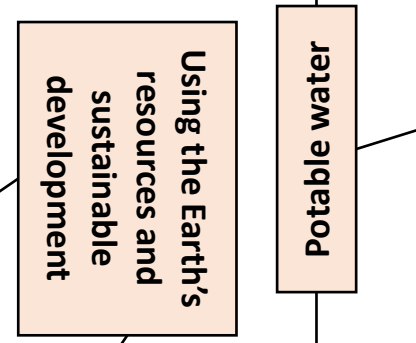
Metals ores	<i>These resources are limited</i>	Copper ores especially are becoming sparse. New ways of extracting copper from low-grade ores are being developed.
Phytomining	<i>Plants absorb metal compounds</i>	These plants are then harvested and burned; their ash contains the metal compounds.
Bioleaching	<i>Bacteria is used to produce leachate solutions that contain metal compounds</i>	The metal compounds can be processed to obtain the metal from it e.g. copper can be obtained from its compounds by displacement or electrolysis.

Reduce, reuse and recycle	<i>This strategy reduces the use of limited resources</i>	This, therefore, reduces energy sources being used, reduces waste (landfill) and reduces environmental impacts.
Limited raw materials	<i>Used for metals, glass, building materials, plastics and clay ceramics</i>	Most of the energy required for these processes comes from limited resources. Obtaining raw materials from the Earth by quarrying and mining causes environmental impacts.
Reusing and recycling	<i>Metals can be recycled by melting and recasting/reforming</i>	Glass bottles can be reused. They are crushed and melted to make different glass products. Products that cannot be reused are recycled.

Sterilising agents include chlorine, ozone and UV light.

	Water of an appropriate quality is essential for life	Human drinking water should have low levels of dissolved salts and microbes. This is called potable water.
	Rain provides water with low levels of dissolved substances	This water collects in the ground/lakes/rivers. To make potable water an appropriate source is chosen, which is then passed through filter beds and then sterilised.
	Needs to occur is fresh water is limited and salty/sea water is needed for drinking	This can be achieved by distillation or by using large membranes e.g. reverse osmosis. These processes require large amounts of energy.

	Used to provide warmth, shelter, food and transport for humans	Natural resources and resources from agriculture provide: timber, food, clothing and fuels. Finite resources from the Earth, oceans and atmosphere are processed to provide energy and materials.
	Research and techniques improve agricultural and industrial processes	These improvements provide new products and improve sustainability.
	Normally made using ethene from crude oil	However, the raw material ethene can also be obtained from ethanol, which can be produced during fermentation. Industries are now starting to use a renewable crop for this process.



Using the Earth's resources and obtaining potable water

AQA GCSE Using resources 1

Life cycle assessment and recycling

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	Includes many stages	<ul style="list-style-type: none"> - Screening and grit removal - Sedimentation to produce sludge and effluent (liquid waste or sewage). - Anaerobic digestion of sludge - Aerobic biological treatment of effluent.

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Life cycle assessment

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		Finite resources from the Earth, oceans and atmosphere are processed to provide energy and materials.
Chemistry and resources		These improvements provide new products and improve sustainability.
Plastics		However, the raw material ethene can also be obtained from ethanol, which can be produced during fermentation. Industries are now starting to use a renewable crop for this process.

Using the Earth's resources and sustainable development

Potable water

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Life cycle assessment

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Phytomining		These plants are then harvested and burned; their ash contains the metal compounds.
Bioleaching		The metal compounds can be processed to obtain the metal from it e.g. copper can be obtained from its compounds by displacement or electrolysis.

Reduce, reuse and recycle		This, therefore, reduces energy sources being used, reduces waste (landfill) and reduces environmental impacts.
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Using the Earth's resources and sustainable development

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UK water		
Desalination		

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Waste water treatment

Alternative methods of extracting metals (HT)

Waste water		
Sewage treatment		

AQA GCSE Using resources 1

Life cycle assessment and recycling

Life cycle assessment

Ways of reducing the use of resources

Metals ores		
Phytomining		
Bioleaching		

Earth's resources		
Chemistry and resources		
Plastics		

LCAS		
Values		

Reduce, reuse and recycle		
Limited raw materials		
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