

Using Resources

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Name the four stages considered in a life cycle assessment. (4 marks)

Step 1 · 1

Extracting and processing raw materials.

Step 2 · 2

Manufacturing and packaging.

Step 3 · 3

Use and operation during its lifetime.

Step 4 · 4

Disposal at the end of its useful life, including transport and distribution at each stage.

Answer: Raw materials; manufacture; use; disposal

Check: Transport between stages is also included.

2. Now try one with the steps

Use the example data to calculate the total energy for each bag over its life cycle. (2 marks)

Step 1 · Paper

Step 2 · Plastic

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Give one example of a natural resource and one of a synthetic product that replaces it. [2]

2. Define the term finite resource and give an example. [2]

3. Define sustainable development. [1]

4. Name the four stages of a life cycle assessment. [4]
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5. Explain what is meant by reduce, reuse and recycle. [3]
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6. The life cycle energy of a paper bag is 1.2 MJ (raw materials), 1.6 MJ (manufacture), 0.3 MJ (transport) and 0.1 MJ (disposal). Calculate the total in MJ. [1]
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7. For a plastic bag the values are 0.8, 0.9, 0.1 and 0.2 MJ. Calculate the total life cycle energy in MJ. [1]
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8. Using your answers to questions 6 and 7, calculate how many times more energy the paper bag uses than the plastic bag. [1]
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9. Explain why recycling metals usually uses less energy than extracting them from ores. [2]
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10. Describe how glass bottles can be reused or recycled. [2]
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11. Making 1 kg of aluminium from ore uses 200 MJ and recycling uses 10 MJ (example figures). Calculate the percentage energy saved. [2]
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12. Explain why life cycle assessments can be difficult to carry out objectively. [2]
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13. Explain how a selective (shortened) life cycle assessment could be misleading. [2]

14. Evaluate whether paper or plastic bags are better for the environment, using your answers to questions 6 to 8 and your own knowledge. [4]

4. Before you hand it in

"An LCA only looks at manufacture."

Include raw materials, manufacture, use and disposal (and transport).

"Recycling makes metals renewable."

Recycling conserves finite resources; it does not make them renewable.

One-sided 'evaluate' answers

Use the data, give points for and against, and reach a justified conclusion.