

(Life cycle assessments (LCAs))

Q1.(2018)

Table 4 gives some information about disposable cups.

Table 4

	Coated paper cups	Poly(styrene) cups
Source of raw materials	Wood	Crude oil
Energy to make 1 cup in arbitrary units	550	200
Biodegradable	Yes	No
Recyclable	No	Yes

Compare the advantages and disadvantages of using coated paper and poly(styrene) to make disposable cups.

Use **Table 4** and your knowledge and understanding of life cycle assessments (LCAs).
[4 marks]

Q2.(2020)

This question is about materials used to make plates.

Plates are made from ceramics, paper or poly(propene).

Paper plates are biodegradable and recyclable.

Which stage of a life cycle assessment (LCA) would contain this information?

[1 mark]

Tick (✓) **one** box.

Disposal at the end of useful life

☐

Extracting and processing raw materials

☐

Manufacturing and packaging

☐

Use and operation during lifetime

☐

Q3.a)(2022)

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This question is about life cycle assessments (LCAs).

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Milk bottles can be made from glass or from a polymer.

Table 10 shows information about milk bottles of equal volume.**Table 10**

	Glass	Polymer
Raw materials	Limestone Sand Sodium carbonate	Crude oil
Energy needed to process raw materials in kilojoules	6750	1710
Energy needed to manufacture bottle in kilojoules	750	90
Mass of bottle in grams	200	20
Mean number of times used during lifetime of bottle	25	1
One disposal method at end of useful life	Recycled to make different glass products	Recycled to make different polymer products

Evaluate the use of glass for milk bottles compared with the use of a polymer for milk bottles.

Use features of life cycle assessments (LCAs) in your answer.

Use **Table 10**.

[6 marks]

Q3.b)(2022)

Milk is also sold in cardboard cartons.

A carton is made using 40 cm³ of cardboard.

The density of the cardboard is 0.40 g/cm³.

Calculate the mass of the carton.

Use the equation:

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

[3 marks]

Mass = _____ g