Recycling and Material Tradeoffs

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

A material choice may depend on several properties. In this model, recovery percentage is the share of used material collected and recovered.

1 A facility recovers 70 kg of material from 100 kg of used containers. What percentage is recovered?

(1) 30 percent

(2) 70 percent

(3) 100 percent

(4) 170 percent

2 Explain why a recovery percentage alone does not establish how much energy a material's recycling uses. [1]

Answer and work

3 A design first requires a minimum durability score. What should be checked before comparing energy use among the candidates?

(1) Whether each material meets the durability requirement

(2) Whether each material has the same color

(3) Whether the sample names are alphabetical

(4) Whether energy use can replace every requirement

4 A material has better recovery but uses more processing energy than another material. Explain why those data can support different choices. [1]

Answer and work

Comparing Reusable Container Materials

Use the information below to answer the questions.

A team compares three model materials using the same test. A container must score at least 70 for durability. Among qualifying materials the team prefers the lowest recycling energy.

Material	Durability score	Recovery (%)	Recycling energy (MJ/kg)
P	82	65	9
Q	74	84	6
R	62	88	4

5 Which material best meets the stated decision rule?

(1) P

(2) Q

(3) R

(4) All three

6 Calculate how much less recycling energy Q uses per kilogram than P. [1]

Answer and work

7 If the minimum durability score rises to 80, which material qualifies?

(1) P only

(2) Q only

(3) R only

(4) P and Q

8 Use one row to explain why choosing solely by highest recovery would conflict with the original durability requirement. [1]

Answer and work