

The Materials Tournament

A second tournament of ratios, fold-change, recycling percentages, and scaling chains.

[ratios] [fold-change] [scaling] [QUESTIONS ONLY] [PRINT-FRIENDLY]

NAME	PERIOD	DATE
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QUESTIONS ONLY - Practice independently or with a group. Use the class sheet as a model, but solve these numbers yourself.

PART A

Strength per gram

Material A supports 240 N with a mass of 30 g. Material B supports 300 N with a mass of 50 g.

1 Find the strength per gram for each material.

2 Which material wins if the fairest comparison is strength per gram?

PART B

Read the curve

A plastic stretches 2 mm under 10 N, 5 mm under 20 N, and 9 mm under 30 N.

1 Find the increase in stretch for each 10 N increase.

2 Is the pattern linear? Use the differences to defend your answer.

The Materials Tournament - continued

PART C

Recycling reality

A town collects 480 kg of plastic. It recycles 35% and sends the rest to landfill.

- 1 Find the recycled mass and landfill mass.

- 2 How much more would be recycled if the rate rose to 50%?

PART D

Scale the bottle

A bottle holds 500 mL. A new design is 1.2 times as tall and 1.1 times as wide and deep.

- 1 Using volume proportional to length x width x depth, find the scale factor.

- 2 Estimate the new capacity.
