Bulk Properties of Solids

Checklist statement	✓
I can define density.	☐
I can apply $\rho = \frac{m}{V}$, define all terms and know their standard units.	☐
I can explain Hooke's law.	☐
I can define elastic limit.	☐
I can apply $F = k\Delta L$, define all terms and know their standard units.	☐
I can define tensile stress and tensile strain.	☐
I can explain elastic strain energy.	☐
I can define breaking stress.	☐
I can apply energy stored $= \frac{1}{2}F\Delta L$, define all terms and know their standard units.	☐
I can explain that elastic strain energy is equal to the area under a force–extension graph.	☐
I can describe plastic behaviour, fracture and brittle behaviour using force–extension graphs.	☐
I can apply energy conservation to situations involving elastic strain energy and energy used to deform materials.	☐
I can describe how spring energy can be transformed into kinetic and gravitational potential energy.	☐
I can interpret simple stress–strain curves.	☐
I can explain energy conservation issues in the context of ethical transport design.	☐

The Young Modulus

Checklist statement	✓
I can define the Young modulus of a material.	☐
I can apply Young modulus $= \frac{\text{tensile stress}}{\text{tensile strain}}$, define all terms and know their standard units.	☐
I can apply Young modulus $= \frac{FL}{A\Delta L}$, define all terms and know their standard units.	☐
I can use stress–strain graphs to determine the Young modulus of a material.	☐
I can describe a required practical to determine the Young modulus using a simple method.	☐