Edexcel Physics – 9PH0

Module 4: Materials

You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
Materials				
How to use the equation: $\rho = \frac{m}{V}$ *where* $\rho = density, m = mass$ *and* $V = volume$				
How to use the relationship upthrust = weight of fluid displaced				
How to use the equation for viscous drag (Stoke's law): $F = 6\pi\eta r v$				
How Stoke's law applies only to small uniformly spherical objects moving at low speeds with laminar flow and viscosity is temperature dependent				
CORE PRACTICAL 4: Use a falling-ball method to determine the viscosity of a liquid				
How to use Hooke's law equation: $\Delta F = k\Delta x$ where k = stiffness of the object				
How to use the relationships: • Stress = force / cross-sectional area • Strain = change in length (extension) / original length • Young modulus = stress/strain				
How to draw and interpret force-extension and force-compression graphs				
The terms **limit of proportionality, elastic limit, yield point, elastic deformation and plastic deformation** and apply these terms to points on a graph				
how to draw and interpret *tensile/compressive* stress-strain graphs and the term **breaking stress**				
CORE PRACTICAL 5: Determine the Young modulus of a material				

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	1	2	3	4
Calculating the elastic strain energy, in a deformed material sample: $$\Delta E(elastic) = \frac{1}{2}Fx$$ Alongside calculating it from the area under the force/extension graph				