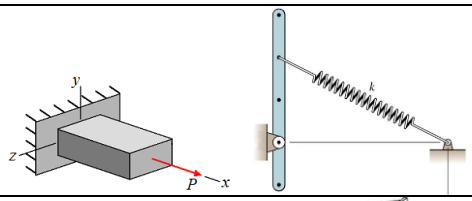
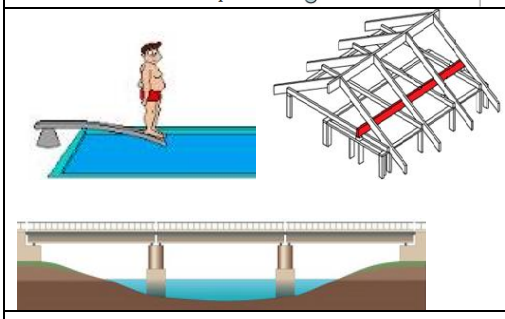
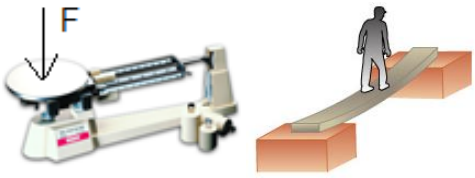
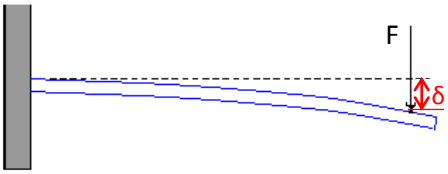
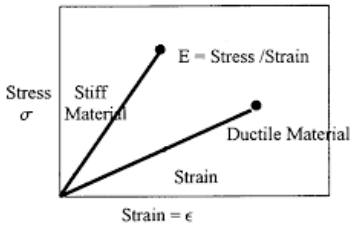
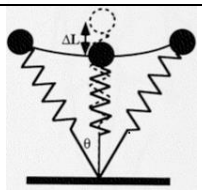
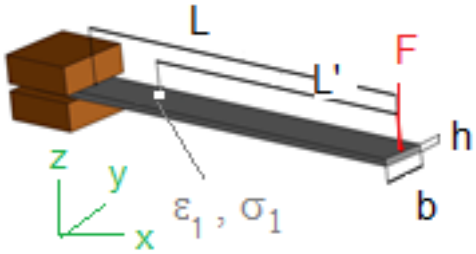
Cantilever Beam Bending Concepts	
	A beam is a slender bar, straight or curved, supported at one or more points along its length [1]
	Beams are used in everyday life and "in mechanical and structural systems, such us buildings, bridges, and aircraft" [1]
	Beams are usually load carrying structural elements
	Beams of different materials but with the same geometry suffer different deflections (□) when subjected to the same load (F)
	The deflections decrease with increasing material Young Modulus, for beams of similar geometry
	Stiffness measures how the system offers resistance to deformation under a load action
	Stress (σ), strain (ε), Young Modulus (E), Poisson ratio (ν), deflection (δ) and beam geometry (b, h, L') relations: $\varepsilon_1 = 6\,F\,L'/(E\,b\,h^2)$; $E = 6\,F\,L'/(\varepsilon_1\,b\,h^2)$; $\varepsilon_1 = \sigma_1/E$ $\delta = FL/(Ebh)\,[4L^2/h^2 + 2.4(1+\nu)]$

[1] Arthur P. Boresi, Richard J. Schmidt, Engineering Mechanics: Statics, Brooks/Cole, Thomson Learning, ISBN 0-534-95152-X, 2001.
Pictures collected from internet resources