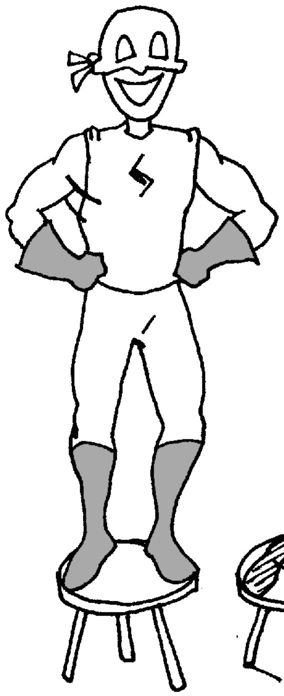
STRESS & STRAIN

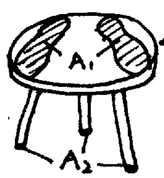


STRESS IS A FORCE/AREA

$$\sigma = F/A$$

units are N/m^2, Psi, Pa

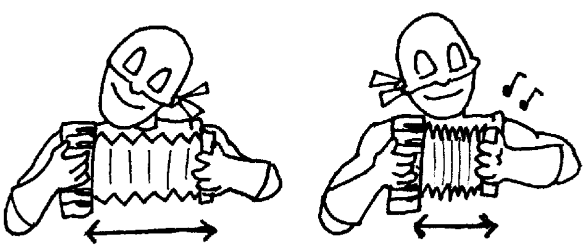
↓ F (Scalar's weight)



← The stress here is less than the stress at A_2 because of the difference in Area.

STRAIN HAS NO UNITS. IT'S THE DIFFERENCE IN LENGTH OVER THE ORIGINAL LENGTH

$$\varepsilon = \frac{L_f - L_o}{L_o}$$



$$\varepsilon = \frac{4-10}{10} = \frac{-3}{5}$$

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$$E = \frac{\sigma}{\varepsilon}$$

NOW, WHEN YOU PUT σ/ε, YOU GET THE **ELASTIC MODULUS** (A.K.A. YOUNG'S MODULUS)

This E differs for every material and it gives you an idea of its relative stiffness.

diamond (high E)
1000 GPa

taffy (low E)
.01 GPa

Aluminum putter (low E)
69 GPa