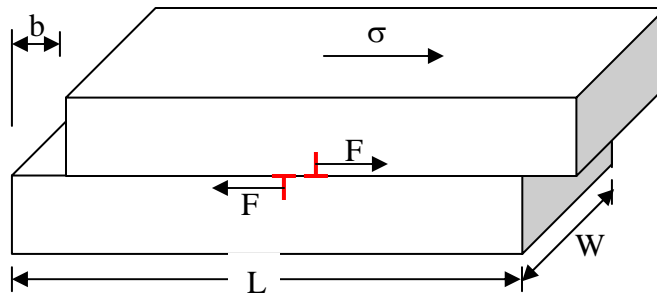Kittel (8th Edition). Chapter 21. Problem 3.
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Macroscopically, the displacement between the two slabs is simply the Burgers vector b. σ is a *shear* stress and it will give rise to a force σLW. This force displaces the upper slab with a distance b, hence the work done by the stress is $W_\sigma = \sigma LWb$.

Microscopically, the displacement of the slabs is a result of the motion of two edge dislocations from the center of the sample to the edges, as shown in the figure. We can image these dislocations are being pushed by a force F (to be determined) from the center to the edge. ∴ Work done by this force is FL/2.
   Total work done by the dislocation force (two dislocations) is $W_F = FL/2 \times 2 = FL$.

W_σ is the same as W_F.

$W_\sigma = W_F \implies \sigma LWb = FL$
$\qquad\qquad \implies$ Force per unit length $= F/W = \sigma b$