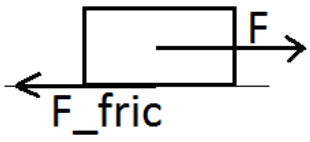
Given:

l – length of way,

v – final speed,

F_{fr} – frictional force

m – mass of the load



From the second Newton law:

$$m\bar{a} = \sum \bar{F}$$

As we can see from the picture above, force (F) that pulls load has opposite direction to frictional force. So in projection on the axis, along which load moves:

$$ma = F - F_{fr},$$

Or

$$F = F_{fr} + ma$$

Where

$$a = \frac{v^2}{2 * l}$$

Job, done by boy:

$$A = \left(\bar{F} * \bar{l}\right)$$

Job is scalar product of the force vector and the displacement vector; in in our case they are collinear.

Hence,

$$A = F * l = \left(F_{fr} + m * \frac{v^2}{l}\right) * l = \left(20 + 20 * \frac{20^2}{2 * 10}\right) * 10 = 4200\, J$$

(where J is Joules)