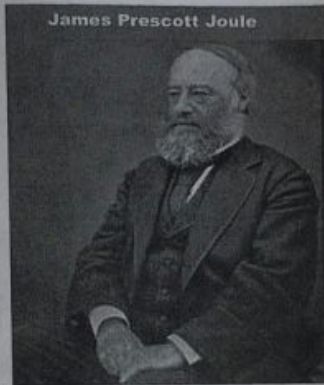


Answer key
Booklet # 43



Unit: Work || Topic: Work 1D
Date: Dec 10, 2015

1

Do-now:

(I) Write the equation for work?

$$W = \vec{F} \cdot \vec{d} \cos \theta$$

(II) The equation for work lists three variables:

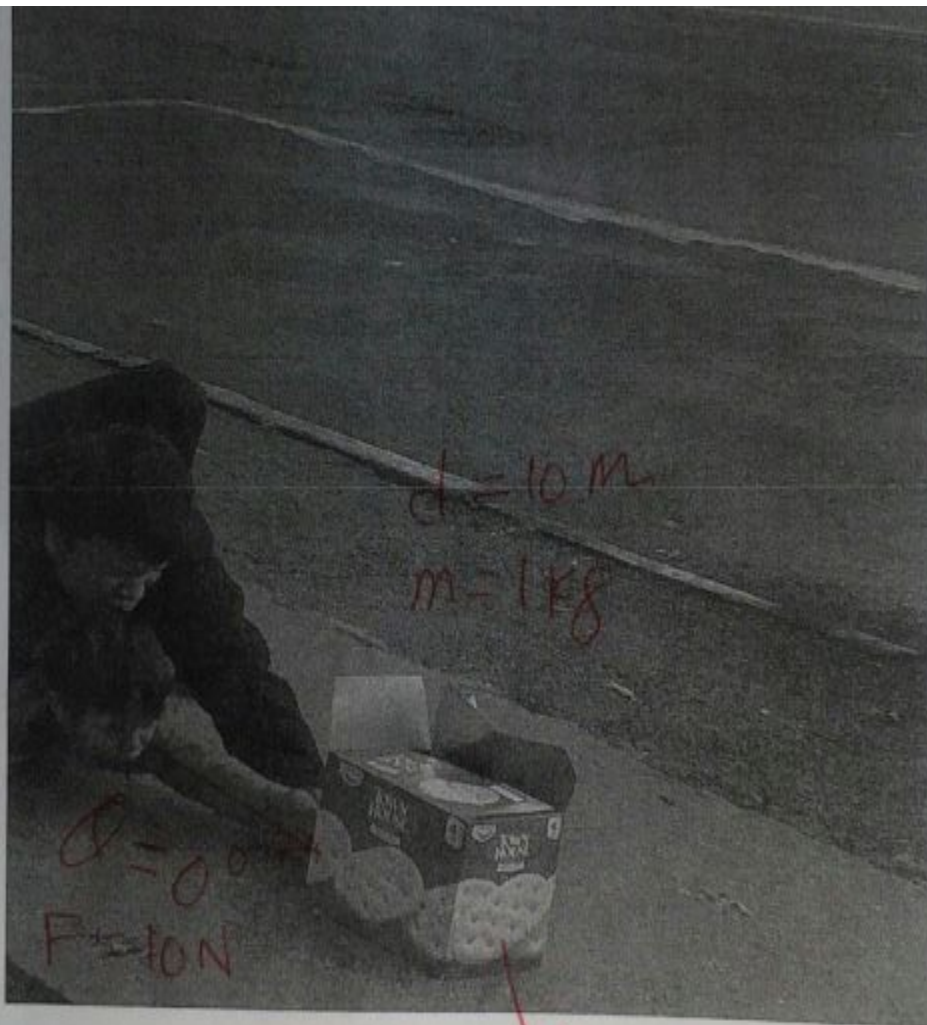
- \vec{F}
- \vec{d}
- Angle

(III) Who is James Prescott Joule?

James Prescott Joule (1818 – 1889) was an English ~~physicist~~ who discovered relationship to between ~~heat~~ and ~~work~~ work. This led to the

-----of Energy, which led to the development of the ~~conservation~~.

The SI for energy, the ~~Joule~~, is named after James Joule.



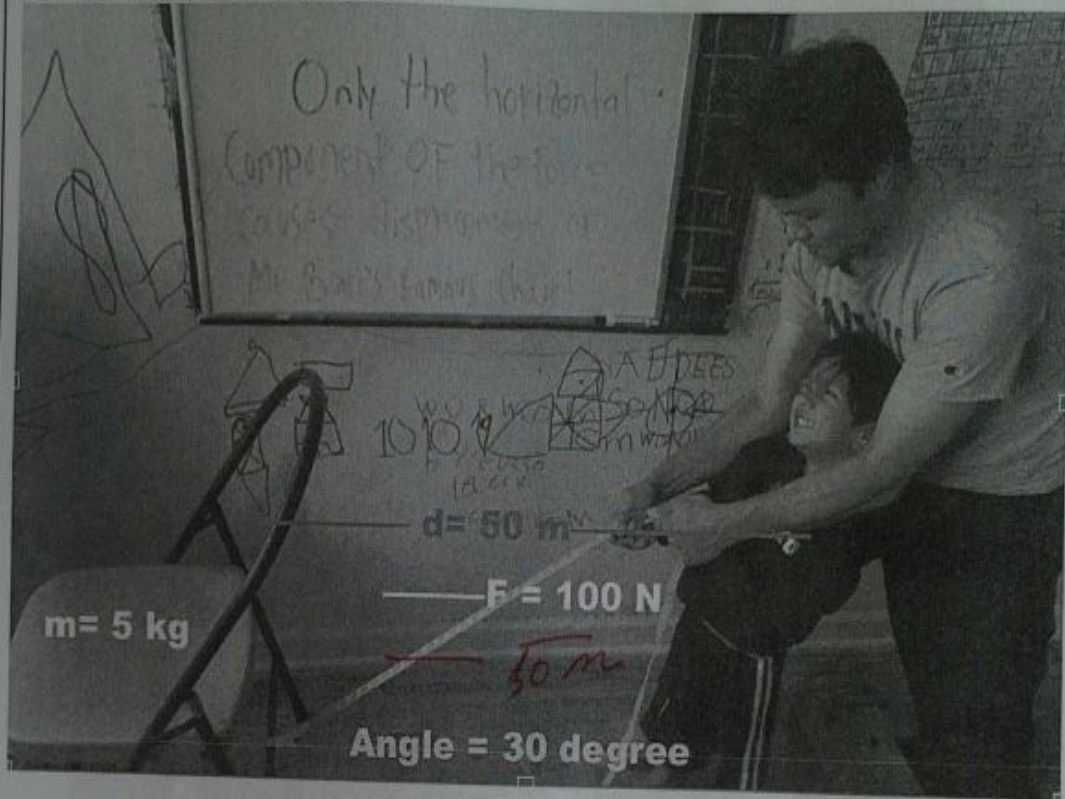
$$\begin{aligned} W &= Fd \cos \theta \\ &= (10 \text{ N}) (10 \text{ m}) \cos 0^\circ \\ &= 100 \text{ J} (1) \end{aligned}$$

$$= \textcircled{100 \text{ J}}$$

3

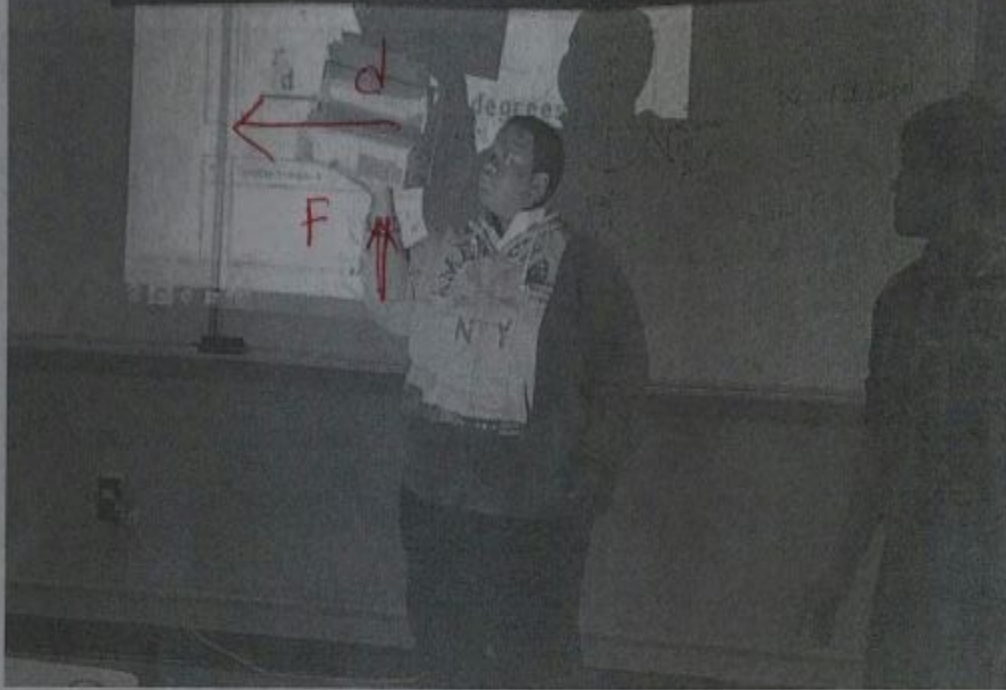
Force acting on Mr. Bari's Famous Chair!

Find the work Mr. Bari and Isaac have done?



$$\begin{aligned}
 W &= Fd \cos \theta \\
 &= (100 \text{ N}) (50 \text{ m}) \cos 45^\circ \\
 &= 5000 \text{ J} \cos 45^\circ \\
 &= (5000 \text{ J}) (0.707) \\
 &= 3535 \text{ J}
 \end{aligned}$$

Is Chazz working or not working? Explain.



Chazz is not working because he is applying force on the object in \perp way, which angle is $\cos 90^\circ$ and $\cos 90^\circ = 0$

So, Chazz total work is (0)

Okay, now let's solve this problem!

This morning, Mr. Bari ran out of gas - and started pushing his car. He applied 10 Newtons for a distance of 10 meters. Find the velocity.



STEP #1

we have	we need
$F = 10\text{ N}$	<u>Velocity of Car</u>
$d = 10\text{ m}$	
$m = 200\text{ kg}$	

STEP #2

$$W = Fd \cos \theta$$
$$(10\text{ N})(10\text{ m}) \cos 0^\circ$$
$$100\text{ J} (1)$$
$$= 100\text{ J}$$

STEP #2

$$W = KE = \frac{1}{2}mv^2$$

$$100\text{ J} = \frac{1}{2}(200\text{ kg})v^2$$

$$\frac{100\text{ J}}{100\text{ kg}} = \frac{100\text{ kg} \cdot v^2}{100\text{ kg}}$$

$$v = 1\text{ m/s}$$

