

# Work



$$W = mad$$

What is it?  
(definition)



A form of energy

Energy is the ability to  
cause a change.

For work to be done

$W = \text{Work}$

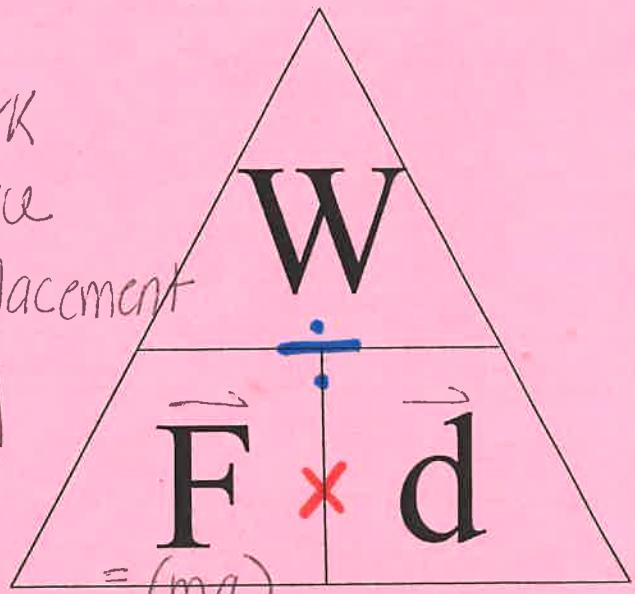
$F = \text{Force}$

$d = \text{displacement}$

$$W = F \times d$$

$$d = \frac{W}{F}$$

$$F = \frac{W}{d}$$



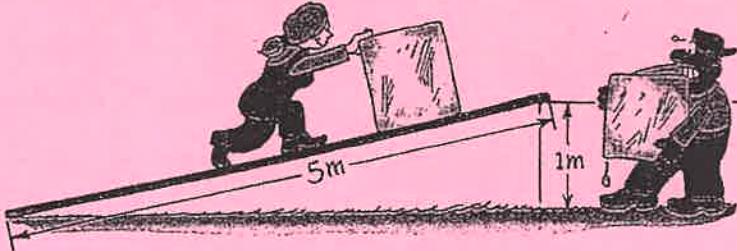
## Important Idea

To do work, force must cause displacement because a vertical force can never cause a horizontal displacement and a horizontal force can never cause a vertical displacement.



Exertion of a force

Displacement of  
something by that force



Measurement	Symbol	Units
Work	W	[J] Joules = N·m
Force	F	[N] Newtons
Displacement	d	[m] meters

## Work and Energy

Energy is the ability to cause change or do work.

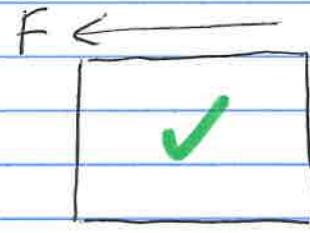
WORK is done when a force causes something to move a distance.

For work to be done, the force and the displacement have to be parallel to each other.

A vertical force cannot cause a horizontal displacement & a horizontal force cannot cause a vertical displacement.

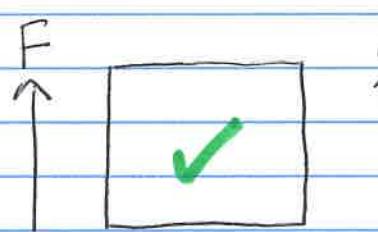


Work is done

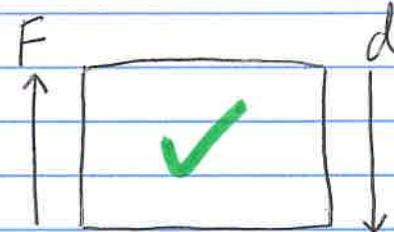


Work is done

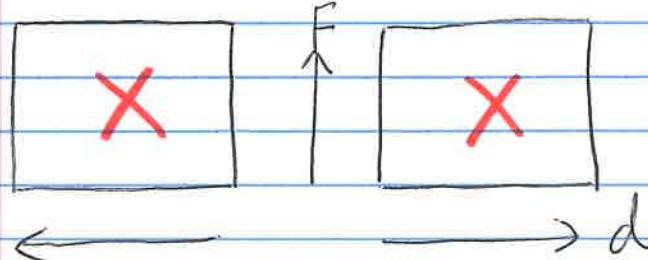
$F \parallel d$



Work is done



Work is done



No work is done.

$F \perp d$