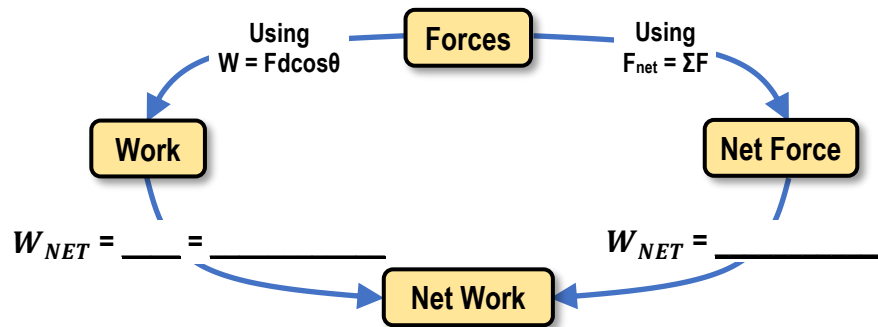
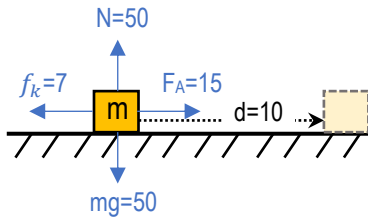


CONCEPT: CALCULATING NET WORK

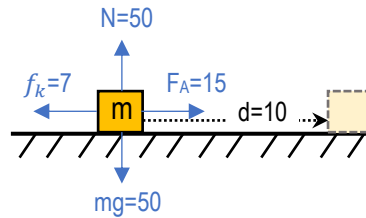
- The NET or TOTAL work done on an object is the _____ of ALL Works done by ALL Forces. Multiple ways to find W_{NET} :



EXAMPLE: You pull a 50N box for 10m on a rough surface with 15N. There's a kinetic friction $f_k = 7\text{N}$. Calculate (a) the works done by all forces; (b) the Net Work done



EXAMPLE: You pull a 50N box for 10m on a rough surface with 15N. There's a kinetic friction $f_k = 7\text{N}$. Calculate (a) the Net Force; (b) the Net Work done on the box



PROBLEM: You pull a 3kg box on a flat surface. The coefficient of kinetic friction is 0.6. When you pull the box horizontally through a distance of 10m, it accelerates at 2m/s^2 . Find the net work on the box.

- A) 17.6 J
- B) 35.3 J
- C) 176.4 J
- D) 60 J

WORK & ENERGY
$KE = \frac{1}{2}mv^2$
$W = Fd\cos\theta$
$W_g = -mg\Delta y$
$W_{NET} = \Sigma W = F_{NET}d\cos\theta$

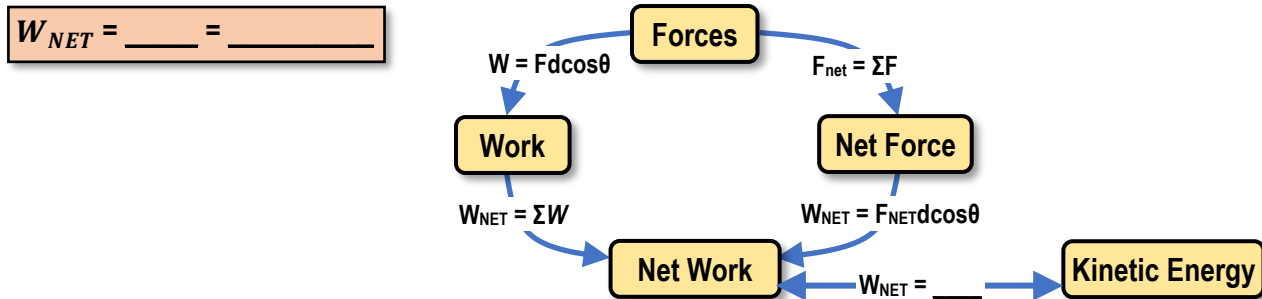
PROBLEM: To pull a 51 kg crate across a rough floor, a worker applies a force of 100 N, directed 37° above the horizontal. The coefficient of friction is 0.16. If the crate moves 3.0 m, what is the total work done on the crate?

- A) 29 J
- B) 0 J
- C) 240 J
- D) 169.6 J

WORK & ENERGY
$KE = \frac{1}{2}mv^2$
$W = Fd\cos\theta$
$W_g = -mg\Delta y$
$W_{NET} = \Sigma W = F_{NET}d\cos\theta$

CONCEPT: THE WORK-ENERGY THEOREM

- Remember: Work is the **transfer** of ENERGY between objects. The Work-Energy Theorem describes this relationship:



EXAMPLE: A 4-kg box has an initial speed of 6m/s at Point A. At Point B, it has a speed of 10m/s. How much work was done to the box from Point A to Point B?

WORK & ENERGY
$KE = \frac{1}{2}mv^2$
$W = Fd\cos\theta$
$W_g = \pm mg\Delta y$

- Whenever forces aren't given, but work is asked for, it's implied that it's the **NET** work.

PROBLEM: A box slides across the floor with an initial speed of 3.5m/s. If the coefficient of kinetic friction is 0.15, how far will the box slide before stopping completely?

- A) 1.19 m
- B) 4.17 m
- C) 9 m
- D) Not enough information

WORK & ENERGY

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

$$W = Fd\cos\theta$$

$$W_g = -mg\Delta y$$

$$W_{NET} = \Sigma W = F_{NET}d\cos\theta = \Delta K$$

PROBLEM: A 5kg is on a rough surface, with a coefficient of friction of 0.6. You push on the box with a constant force, such that the box moves with a constant 8m/s. Find the net work on the box.

WORK & ENERGY

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

$$W = Fd\cos\theta$$

$$W_g = -mg\Delta y$$

$$W_{NET} = \Sigma W = F_{NET}d\cos\theta = \Delta K$$

- The Work-Energy Theorem is very useful conceptually. If an object has **constant speed**, $\Delta K = \underline{\hspace{1cm}} \rightarrow W_{NET} = \underline{\hspace{1cm}}$.