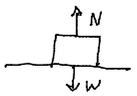
# Newton's 3rd Law

If A pushes on B, B pushes on A with

- same type of force
- same magnitude of force
- in the opposite direction

"force pairs" or "twins"

e.g. 


What is the twin of the normal force?

A) weight of the block
B) normal force on the table
C) both
D) neither

twins always act on different objects

twin of N above

N is "table pushes up on block"

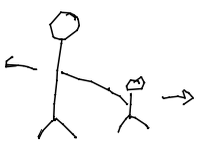
twin is "block pushes down on table"

W is "earth pulls down on block"

twin is "block pulls up on Earth"

Which is larger?

A) force of Earth on block
B) force of block on Earth
C) Both the same N3L

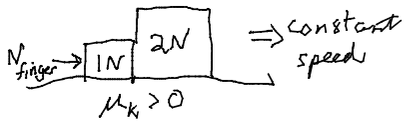


I exert the same force on him as he exerts on me.

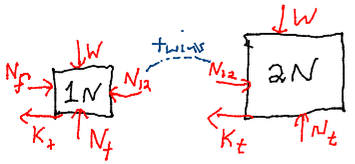
What we see (effect) is the acceleration not the forces!

$$a = \frac{F}{m}$$

I have larger mass so I have smaller acceleration.



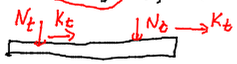
⇒ constant speed




How many forces are acting on the 1N block? A) 1 B) 2 C) 3 D) 4 E) 5 F) 6

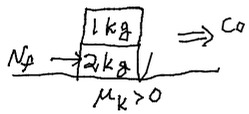
What is net force on the table due to the blocks?

A) ↓ B) → C) ↘ D) ↖ E) ↑ F) ←

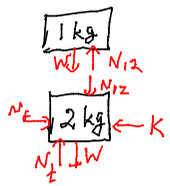



---

e.g.



⇒ const v




Is there a frictional force on 1kg block?

A) No

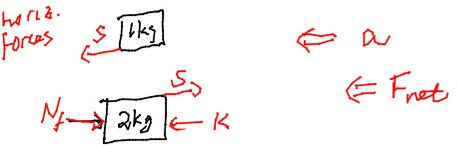
B) Yes, S →

C) Yes, S ←

D) " K →

E) " K ←

What if it's slowing down?




$S = (1\,kg)a$

but if this is $> \mu_s N_{12}$

then S breaks

& 1kg block flies off