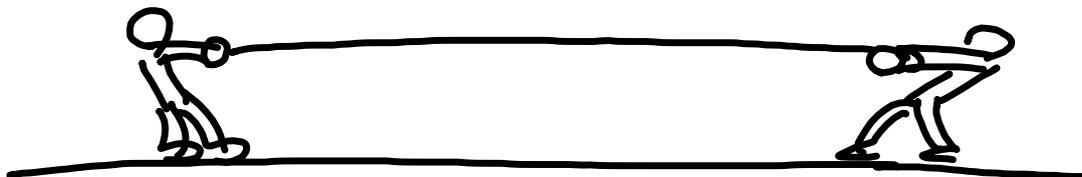
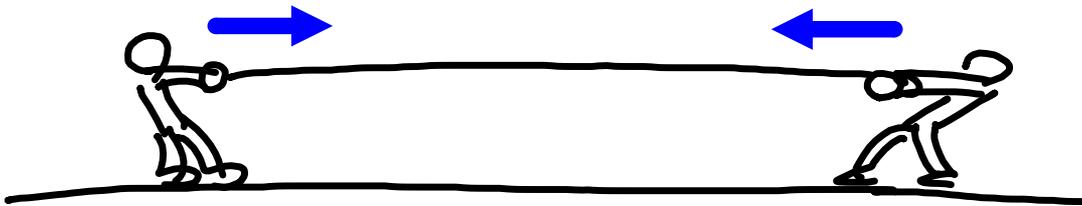


How do you win tug-of-war?



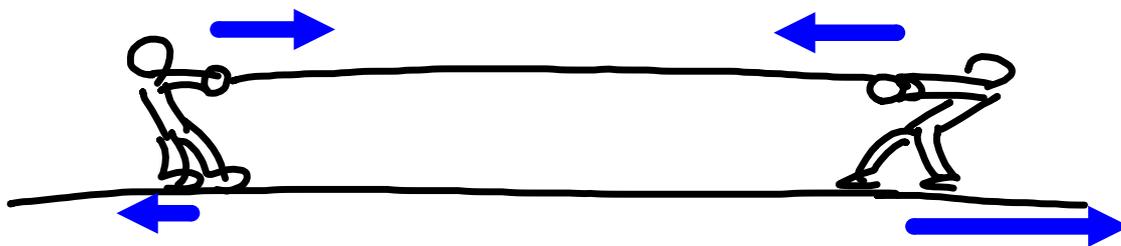
Pull harder than the other team??

**Tension forces at both ends of a rope
are EQUAL.**



It's impossible to pull harder than the other team.

Tug-of-War is a Friction Contest!

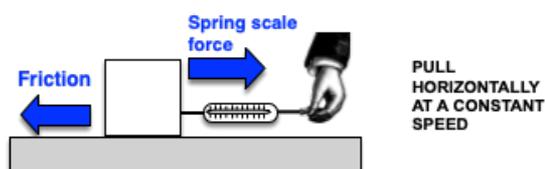


You win by getting more friction
than the other team!

Friction Challenges:

What can you change to get more friction for your block?

What can you change to get less friction for your block?



You must be pulling horizontally.

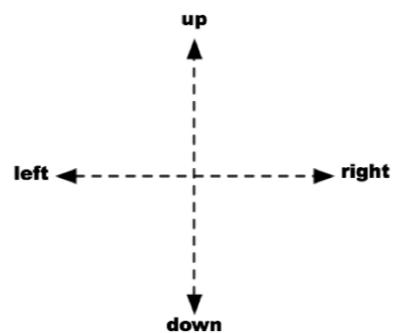
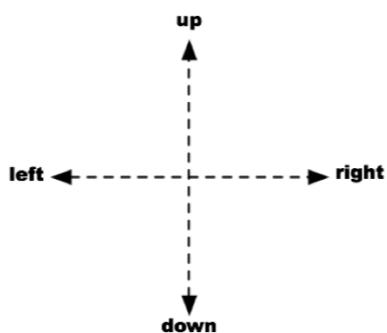
What affects friction?

1. The surfaces: rough, sticky, smooth or slippery.
2. The amount of force that pushes the surfaces together.

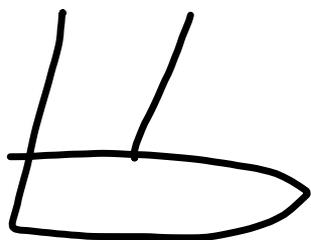
Does surface area affect friction?

Not really

How do you win tug-of-war? (what are the forces involved?)



A lot of water



A little water

