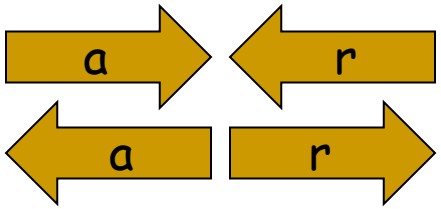
Forces in Pairs

Objective: To practice action-reaction forces.

Newton's Third Law

- Action: a push or pull that acts in one direction.
- Reaction: a push or pull that acts in the opposite direction.
- Newton's Third Law of Motion: For every action force there is an equal and opposite reaction force.



Balloon

- Action: force of the balloon against escaping air.
- Reaction: force of escaping air against the balloon.
- Effect: balloon moves in a direction opposite to the escaping air.

Skate Board and Sand

- Action: push of skater on bag of sand.
- Reaction: push of bag of sand on skater.
- Effect: both move but the sand moves further (less mass).

Nickel on the Bottle

- Action: warmed air particles push on the nickel.
- Reaction: nickel pushes on warmed air particles.
- Effect: Nickel "pops" off the top of the bottle.

Tug 'O War

- Action: rope pulled by one person.
- Reaction: rope pulled in the opposite direction by the other person.
- Effect: If the rope doesn't move – forces are equal. If one force is stronger the rope moves in that direction.

Push on the Lab Table

- Action: person pushing on the table.
- Reaction: table pushing on the person.
- Effect: no motion; forces are equal.

Ruler and the Nickel

- Action: hand pushes down on the ruler.
- Reaction: ruler pushes nickel up.
- Effect: nickel flies into the air from being pushed up by the ruler.