Unit 4: Newton's Laws

Newton's 3rd Law

Newton's 3rd Law:

For every action force there is an equal (in magnitude) and opposite (in direction) reaction force.

Any interaction involves two forces that we call...

action - reaction force pairs

1) You hit a baseball with a bat.

bat hits ball - ball hits bat

2) A sprinter starts running.

runner pushes ground - ground pushes runner

3) A fish swims through water.

fish pushes water - water pushes fish.

Imagine a bug hitting the windshield of a semi trailer.

What force pair occurs?

truck hits bug - bug hits truck

Which force is bigger?

NEITHER!

Which object has a greater acceleration?

The bug since $m_{bug} << m_{truck}$

Example 1: Recoil

gun pushes bullet - bullet pushes gun

Example 2: Bricks

man hits brick - brick hits man

Example 3: Rockets

rocket pushes out exhaust gasses - gasses propel rocket