

Forces

An Introduction



What Is A Force?

A force is either a **push** or a **pull**.



Forces always act in **pairs**.
Forces always act in some **direction**.

What Do Forces Do?

Forces can have several **effects** on an object.

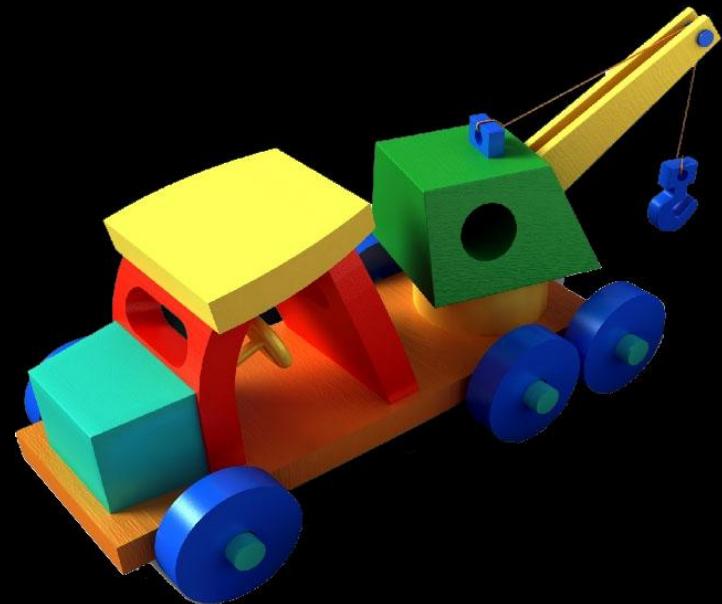
Give it **energy**.

Make it **start moving**.

Make it **stop moving**.

Make it **change direction**.

Make it **change shape**.



Types of Forces

There are different types of forces.

Gravity

Friction

Elastic

Buoyancy

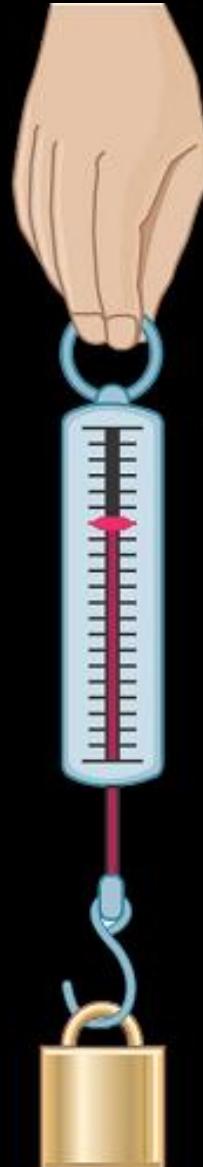
Normal

Measuring Forces

Forces can be measured.

The strength of a force is measured in newtons (n).

One newton (1 n) is the roughly amount of force used to pick up an apple off the floor.

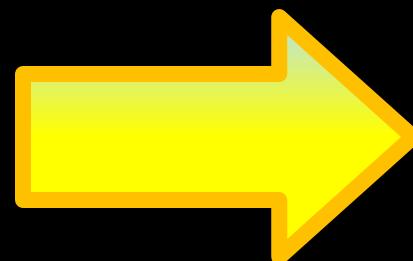
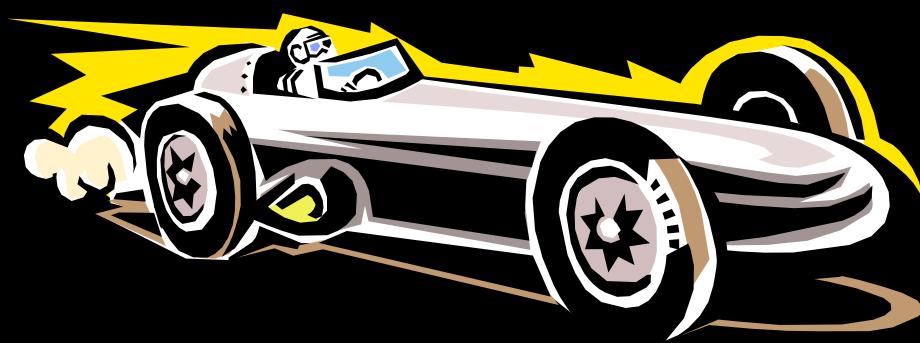


Measuring Forces

Forces can be shown using **arrows**.

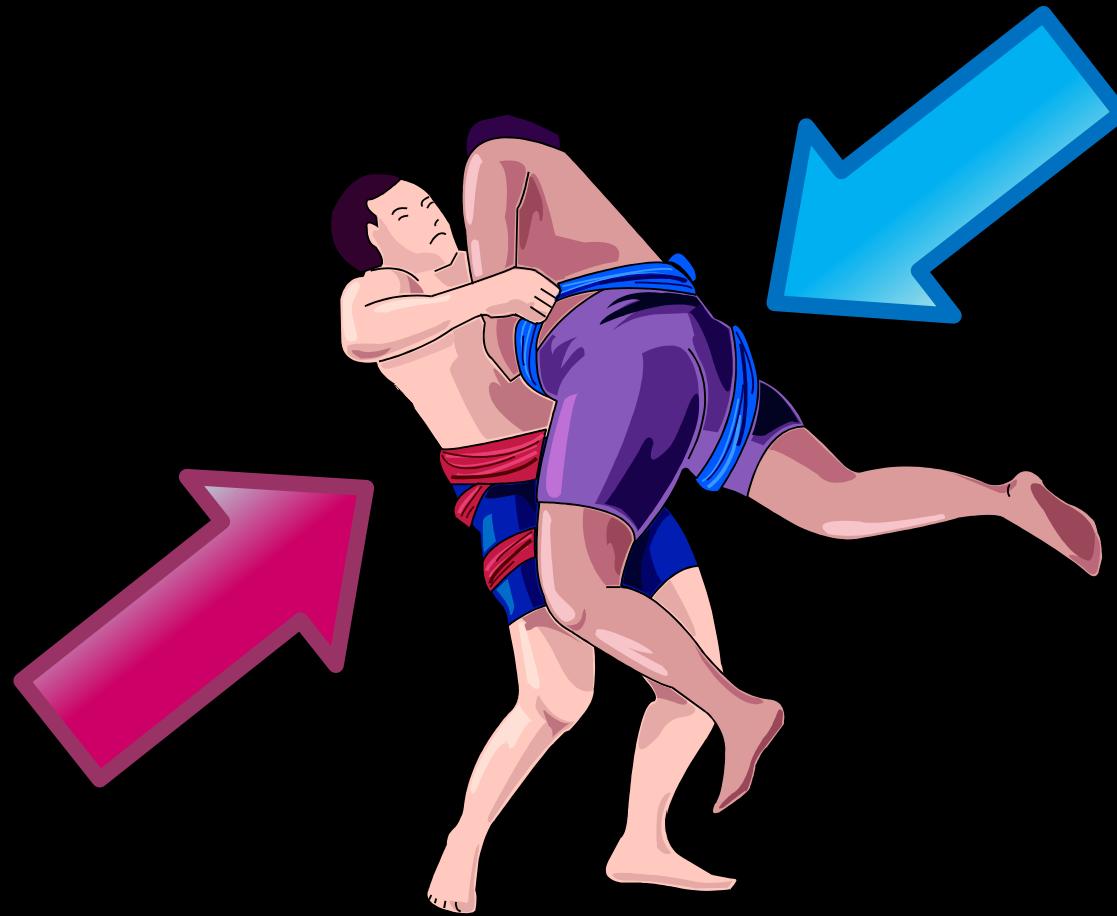
The **length** of the arrow is the **size** of the force.

The **direction** of the arrow is the **direction** that the force is acting in.



Measuring Forces

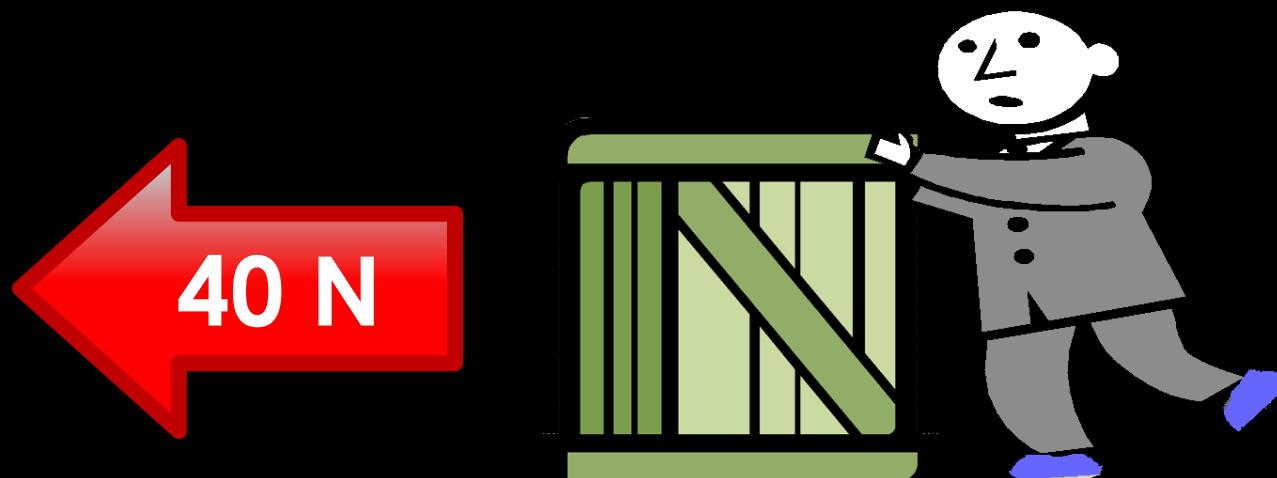
Forces can be shown using **arrows**.



Interacting Forces

Forces usually act together.

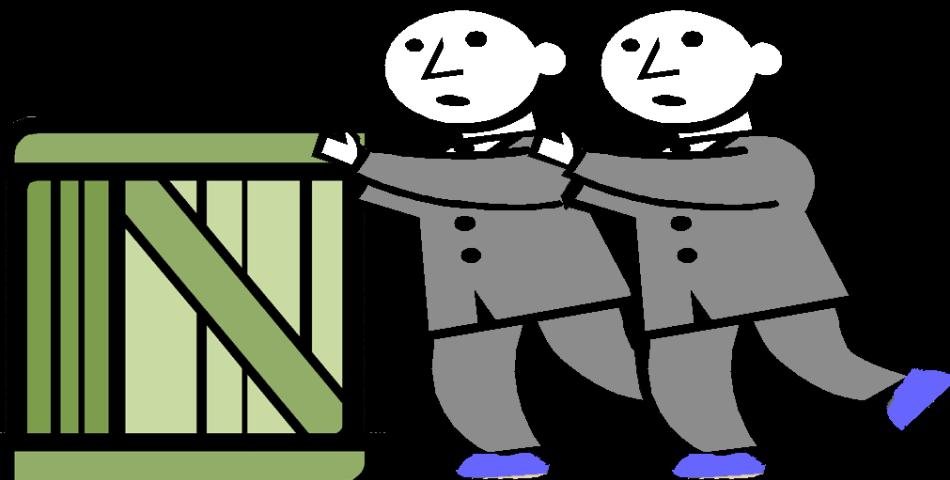
When 2 forces act in the same direction,
the forces add together.



Interacting Forces

Forces usually act together.

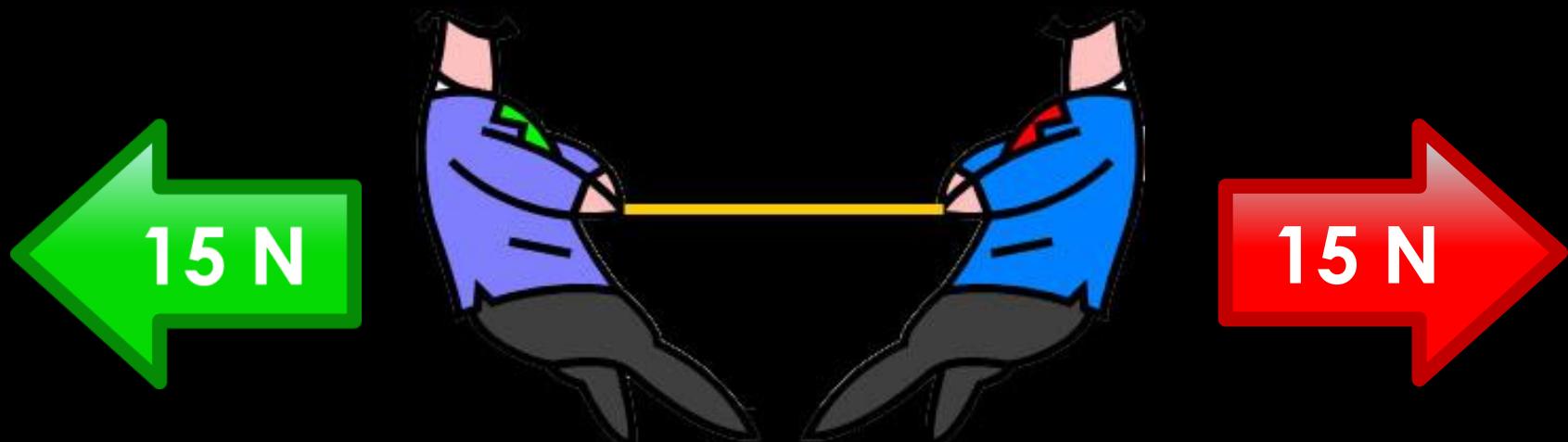
When 2 forces act in the same direction,
the forces add together.



Interacting Forces

Forces can be balanced or unbalanced.

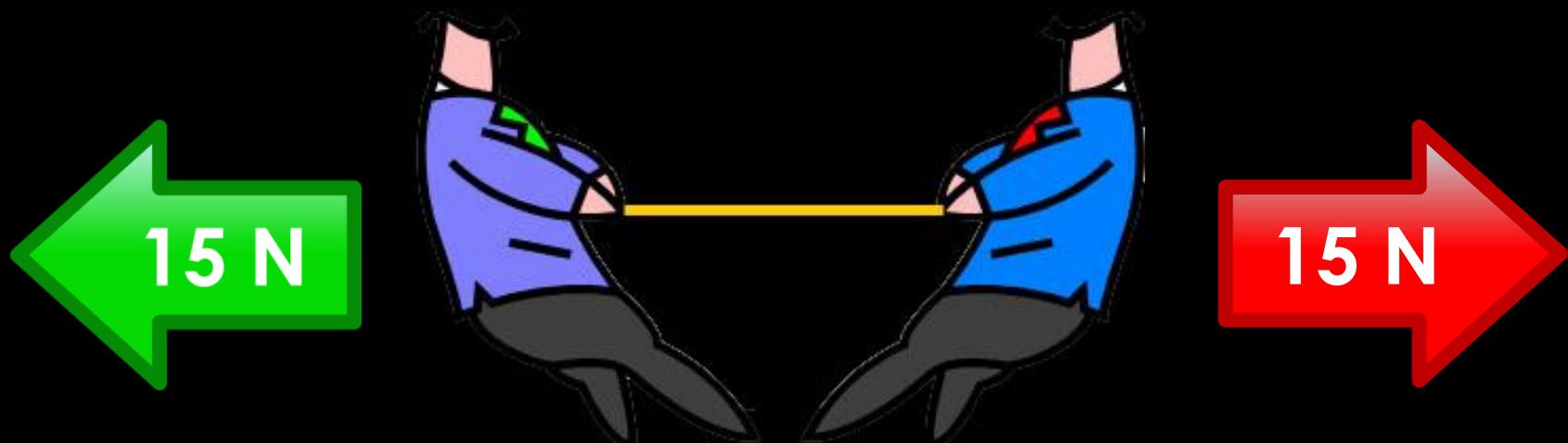
When 2 forces act in equal and opposite directions, they are balanced.



Interacting Forces

Forces can be balanced or unbalanced.

The resulting force, or net force, is zero.

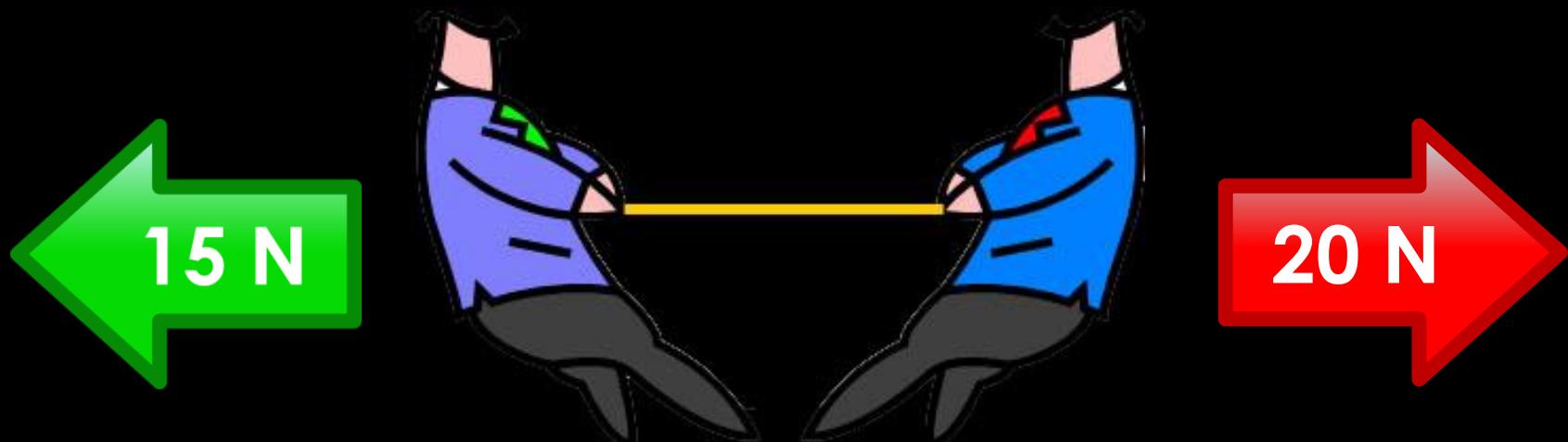


no net force

Interacting Forces

Forces can be balanced or unbalanced.

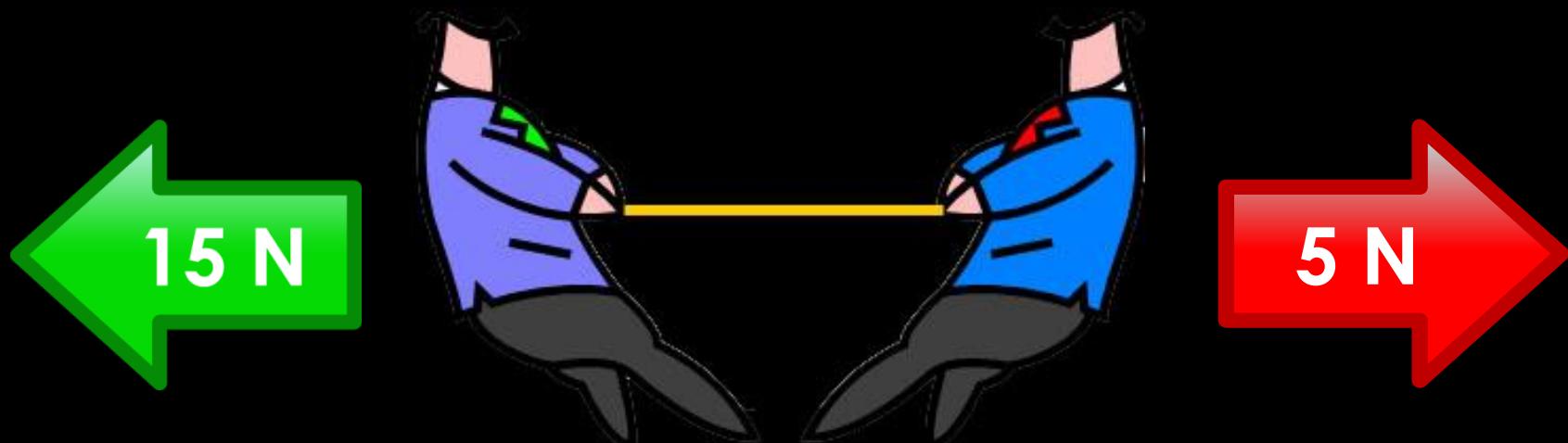
But when two forces are unequal,
the forces are unbalanced.



Interacting Forces

Forces can be balanced or unbalanced.

The net force will be the remaining force,
in whatever direction.



net force of 5 N to the right

Drawing Forces

Forces can be drawn using **force diagrams**.

Force diagrams show any object as a **simple box** plus the **forces** acting on it.

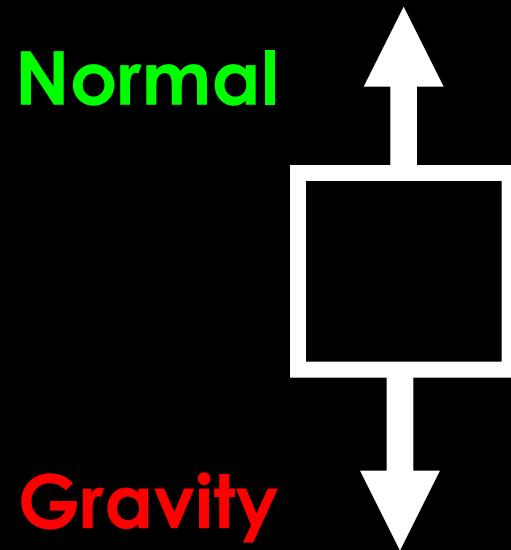
What forces are acting on this crate?



Drawing Forces

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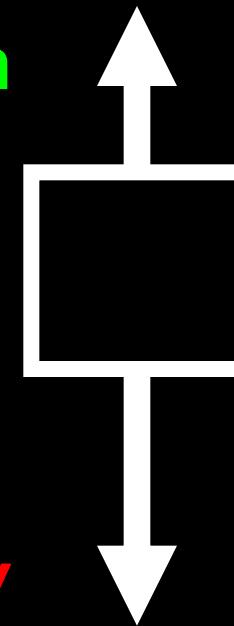
Drawing Forces

What forces are acting on the skydiver?



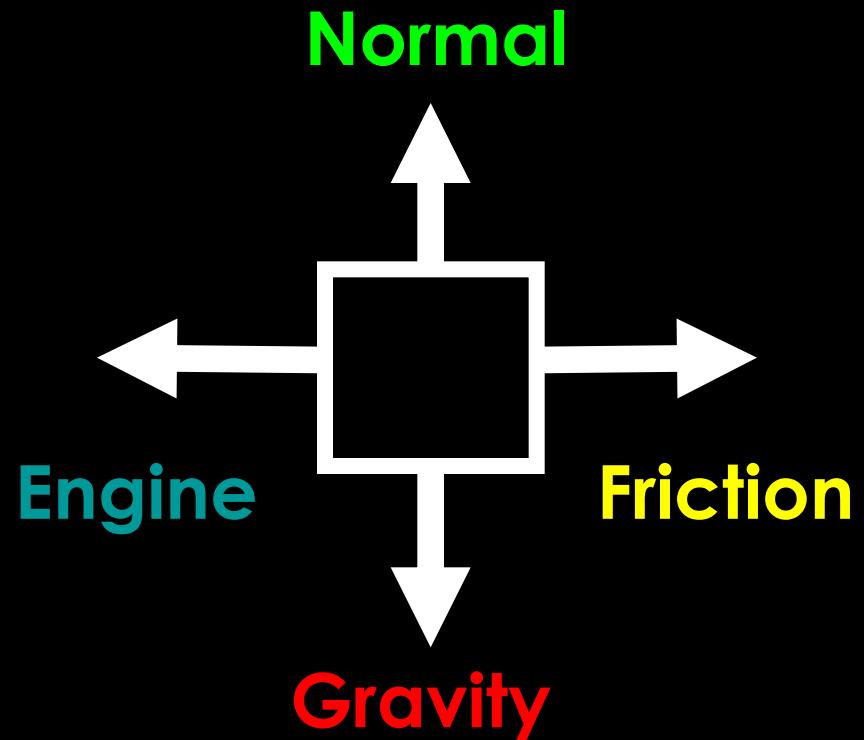
Friction

Gravity



Drawing Forces

What forces are acting on the moving car?



A photograph of a space shuttle launching from a launch pad. The shuttle is white with a dark blue thermal protection system on its nose and wings. It is mounted on a large white external fuel tank with two solid rocket boosters attached. A tall metal tower stands to the left of the shuttle. The background is a clear blue sky with some white clouds. In the foreground, there is a large plume of white smoke and fire at the base of the shuttle.

Any Questions?