

Balanced and Unbalanced Forces



Hello, my name is Dr. Mekiva Aldine.

I am a researcher at the University of Texas who studies how airplanes fly.

- I have been working with my team to better understand force and motion for 20 years.
- Our research has been shared by other scientists all over the world.
- We created this document to help future generations understand and love science.

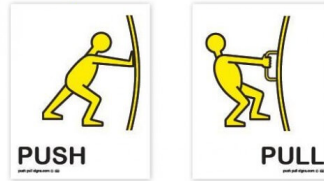


Force and Motion



Motion is the action or process of moving or being moved. In science, motion is a change in position compared to a place or an object that is not moving.

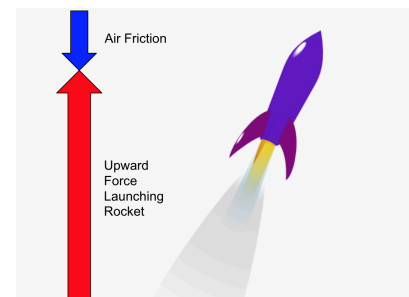
pushes and pulls - forces and motion



Force can push or pull on an object, and it has strength and direction. A force can cause an object to accelerate, slow down, or remain in place.



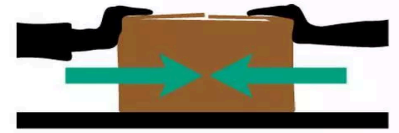
Unbalanced Forces can cause an object to change its motion. They can also change the speed or direction of an object that is already in motion, and if an object is at rest and an unbalanced force pushes or pulls the object, it will move. For example, there must be an unbalanced force to push the rocket up into the air.



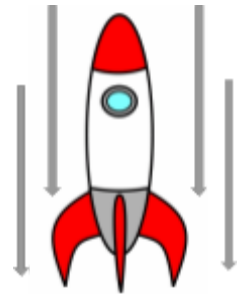
Rockets fly super fast when they are pushed into the air.

Balanced Forces are when two forces are the same strength but act in the OPPOSITE direction. They do NOT cause a change in motion. If forces are balanced, they can cancel each other out.

Balanced forces = no acceleration

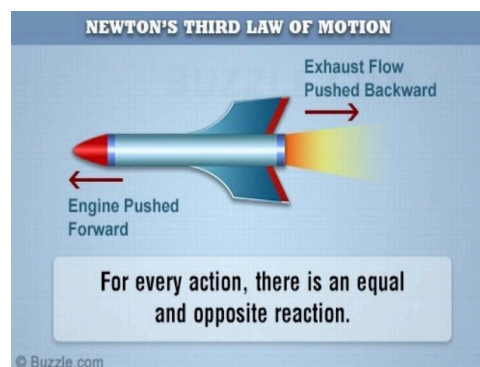


Air Friction holds back the movement of an object. If you shoot a rocket in the air, the air pushes on the rocket's wings and slows it down.

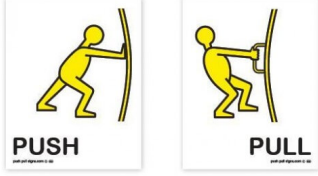
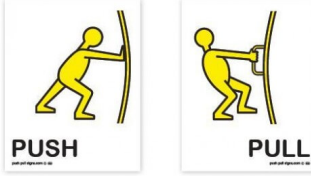




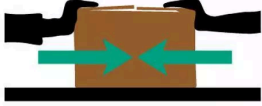
If a rocket has large wings, there will be more air friction pushing on that object.

Newton's Laws of Motion are important to rocket science. His third law states that “For every action, there is an equal and opposite reaction.”



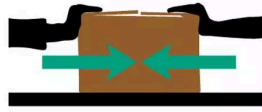
Vocabulary

<p>Motion</p>	<p>pushes and pulls - forces and motion</p> 	<p>Motion is the action or process of moving or being moved.</p>
<p>El movimiento</p>	<p>pushes and pulls - forces and motion</p> 	<p>El movimiento es la acción o proceso de moverse o ser movido.</p>
<p>Force</p>		<p>Force can push or pull on an object, and it has strength and direction. A force can cause an object to accelerate, slow down, remain in place, or change shape.</p>

<p>La fuerza</p>		<p>La fuerza puede empujar o tirar de un objeto, y tiene fuerza y dirección. Una fuerza puede hacer que un objeto se acelere, disminuya, permanezca en su lugar o cambie de forma.</p>
<p>Balanced Forces</p>	<p>Balanced forces = no acceleration</p> 	<p>Balanced Forces do not cause a change in motion. When two forces are the same strength but act in OPPOSITE direction. If forces are balanced, they can cancel each other out.</p>

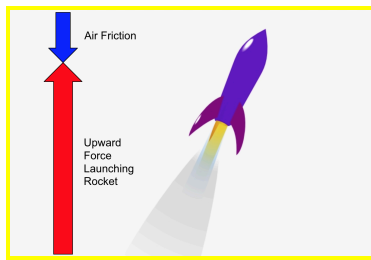
Las fuerzas equilibradas

Balanced forces = no acceleration



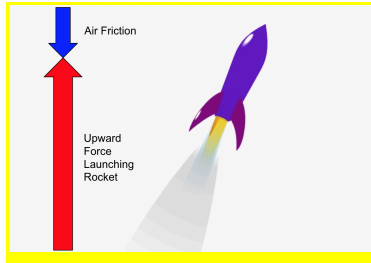
Las fuerzas equilibradas no causan un cambio en el movimiento. Cuando dos fuerzas tienen la misma fuerza pero actúan en dirección OPUESTA. Si las fuerzas están equilibradas, pueden cancelarse mutuamente.

Unbalanced Forces



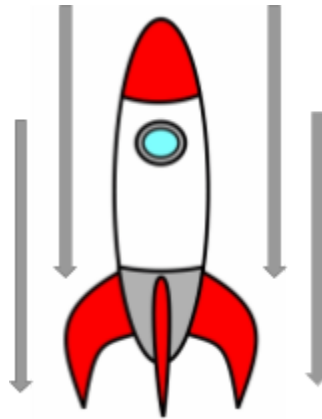
Unbalanced forces can cause an object to change its motion, speed or direction. For example, there must be an unbalanced force to push the rocket up into the air.

Las fuerzas
desequilibradas

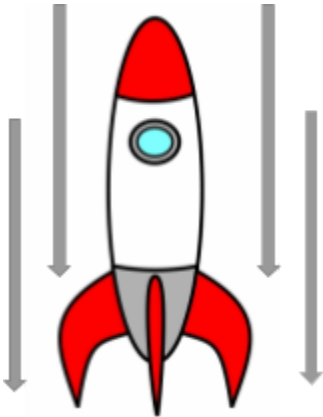


Las fuerzas
desequilibradas
pueden hacer que
un objeto cambie su
movimiento,
velocidad o
dirección. Por
ejemplo, debe haber
una fuerza
desequilibrada para
empujar el cohete
hacia el aire.

Air Friction



Friction is a force
that holds back the
movement of an
object when objects
come into contact
with each other.
The force of
friction acts in the
opposite direction.

<p>La fricción</p>		<p>La fricción es una fuerza que frena el movimiento de un objeto cuando los objetos entran en contacto entre sí. La fuerza de fricción actúa en la dirección opuesta.</p>
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Song: Wheels on the Bus

Motion's the action of
 Be-ing moved,
 Be-ing moved,
 Be-ing moved,
 Motion's the action of
 Be-ing moved,
 Chang-ing positions!

Force can cause,
 Push and pull,
 Push and pull,
 Push and pull,
 Force can cause,
 Push and pull,
 Caus-ing change.

Balanced forces have,
No acceleration,
No acceleration,
No acceleration,
Balanced forces have,
No acceleration,
Caus-ing NO change,

Unbalanced forces cause,
Change in motion,
Change in motion,
Change in motion,
Unbalanced forces cause,
Change in motion,
...all through the town....

Friction is a force that,
Holds back movement,
Holds back movement,
Holds back movement,
Friction is a force that,
Holds back movement,
Acting in opposite direction