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.

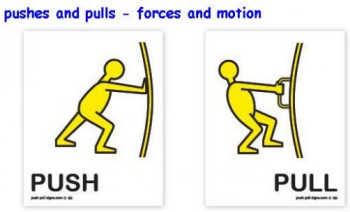
- I have been working with my team to better understand force and motion for 20 years.
- Our research has been shared by other scientists all over the world.
- We created this document to help future generations understand and love science.



Force and Motion



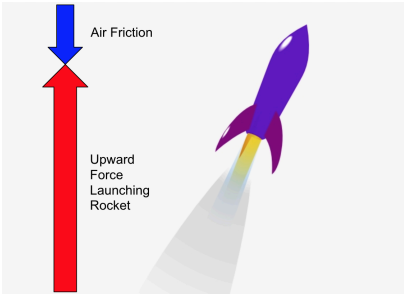
Motion is the action or process of moving or being moved. In science, motion is a change in position compared to a place or an object that is not moving.



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.

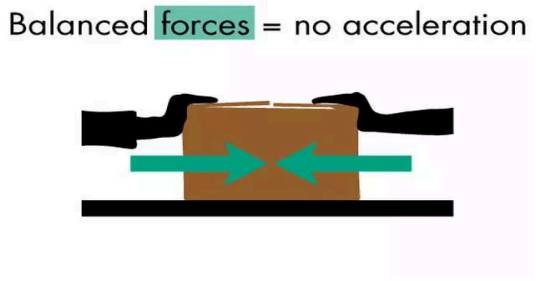


Unbalanced Forces can cause an object to change its motion. They can also change the speed or direction of an object that is already in motion, and if an object is at rest and an unbalanced force pushes or pulls the object, it will move. For example, there must be an unbalanced force to push the rocket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

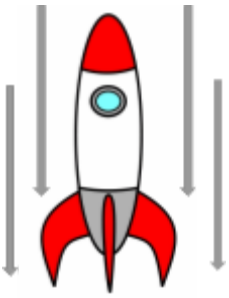


Rockets fly super fast when they are pushed into the air.

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.

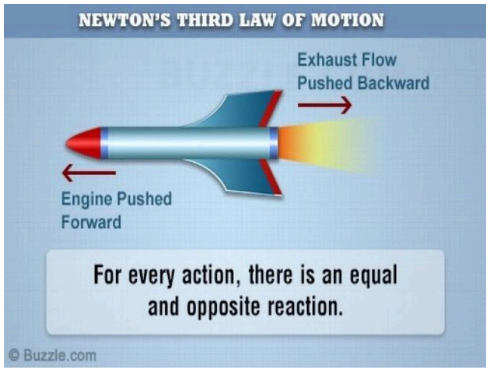


Air Friction holds back the movement of an object. If you shoot a rocket in the air, the air pushes on the rocket's wings and slows it down.

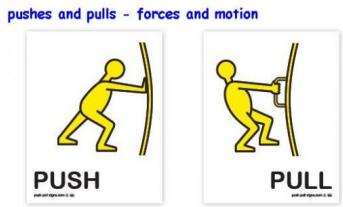
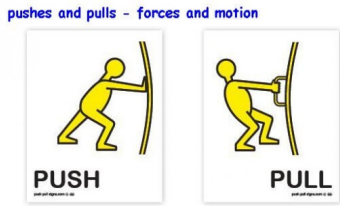


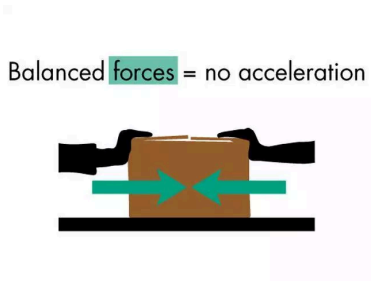
If a rocket has large wings, there will be more air friction pushing on that object.

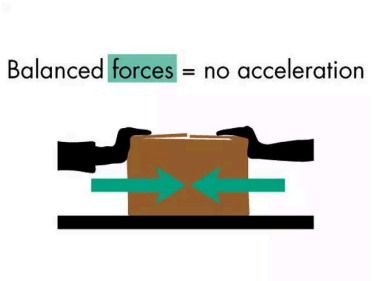
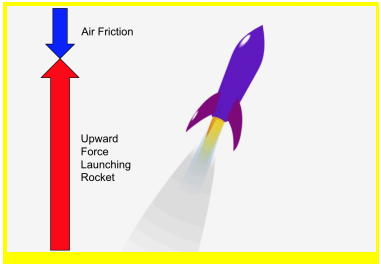
Newton's Laws of Motion are important to rocket science. His third law states that "For every action, there is an equal and opposite reaction."

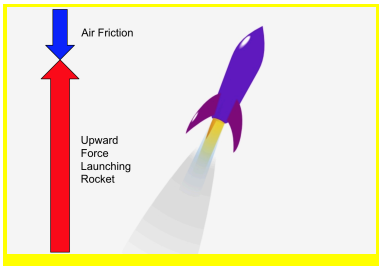
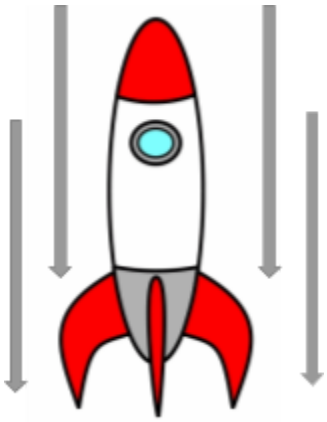


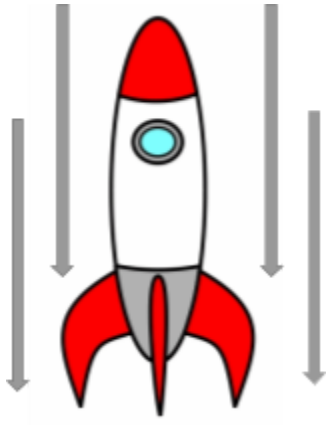
Vocabulary

Motion		Motion is the action or process of moving or being moved.
El movimiento		El movimiento es la acción o proceso de moverse o ser movido.
Force		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.

La fuerza		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.
Balanced Forces		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.

Las fuerzas equilibradas		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.

La fricción		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.

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