

Introduction to

FORCES

<https://app.discoveryeducation.com/learn/player/22c8afde-e71e-4f0a-a7d8-2435bf83739a>

Mass _____

Weight _____

<https://www.youtube.com/watch?v=1whMAIGNq7E>

So ... are mass and weight the same thing? _____

<https://app.discoveryeducation.com/learn/videos/53c1fecb-8e99-4497-829e-088e9c89baad?hasLocalHost=false>

Important words from video:

Force _____

What Happens When Two Unbalanced Forces Act on an Object?

A **force** is any interaction that will change the motion of an object when unopposed. For example, in pushing a shopping cart, you are exerting a force on the cart. Your pushing can change the direction and speed of the cart. There are some forces like air resistance and **friction** with the ground that are opposing the force you exert. However, these forces are not large enough to stop the motion. When two forces are applied to an object, the object will accelerate in the direction of the net force, or the vector sum of the two forces. That is, the largest force tends to dominate. For example, if you were pushing a chair across the floor, you would exert enough force to move it. But if someone stronger than you were to push the chair from the other side, that force would override the force you put on the chair. The chair would then move in the same direction of the stronger force.

If the forces are balanced, meaning equal in magnitude but opposite in direction, then the **acceleration** is zero. For example, if two friends push equally hard on a box but in opposite directions, then the box will not move. If the forces are unbalanced, however, the object will accelerate. If one friend pushes north and the other pushes south but

with less force, then the box will move north. If one friend pushes north and the other pushes east, then the box will move in a northeast direction.

Balanced force _____

Unbalanced force _____

Consider a game of tug of war between Tim, Elena, and Anne. Tim can pull with a force of 70 N, Elena can pull with a force of 100 N, and Anne can pull with a force of 30 N. Determine if the different configurations of teams are balanced or unbalanced. Drag each configuration of teams into the correct row.

| | | |
|--------------------------------|--------------------------------|--------------------------------|
| Tim versus Elena and Anne ⋮ | Elena versus Tim and Anne ⋮ | Anne versus Tim and Elena ⋮ |
| Balanced | <input type="text"/> | |
| Unbalanced | <input type="text"/> | |

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Monster truck pulling contest! Powerful forces are in action here.

1. Which monster truck had the strongest pulling force? _____

2. What happens when two forces pull in the opposite direction? _____

3. What combination of forces was the closest match? Why? _____
