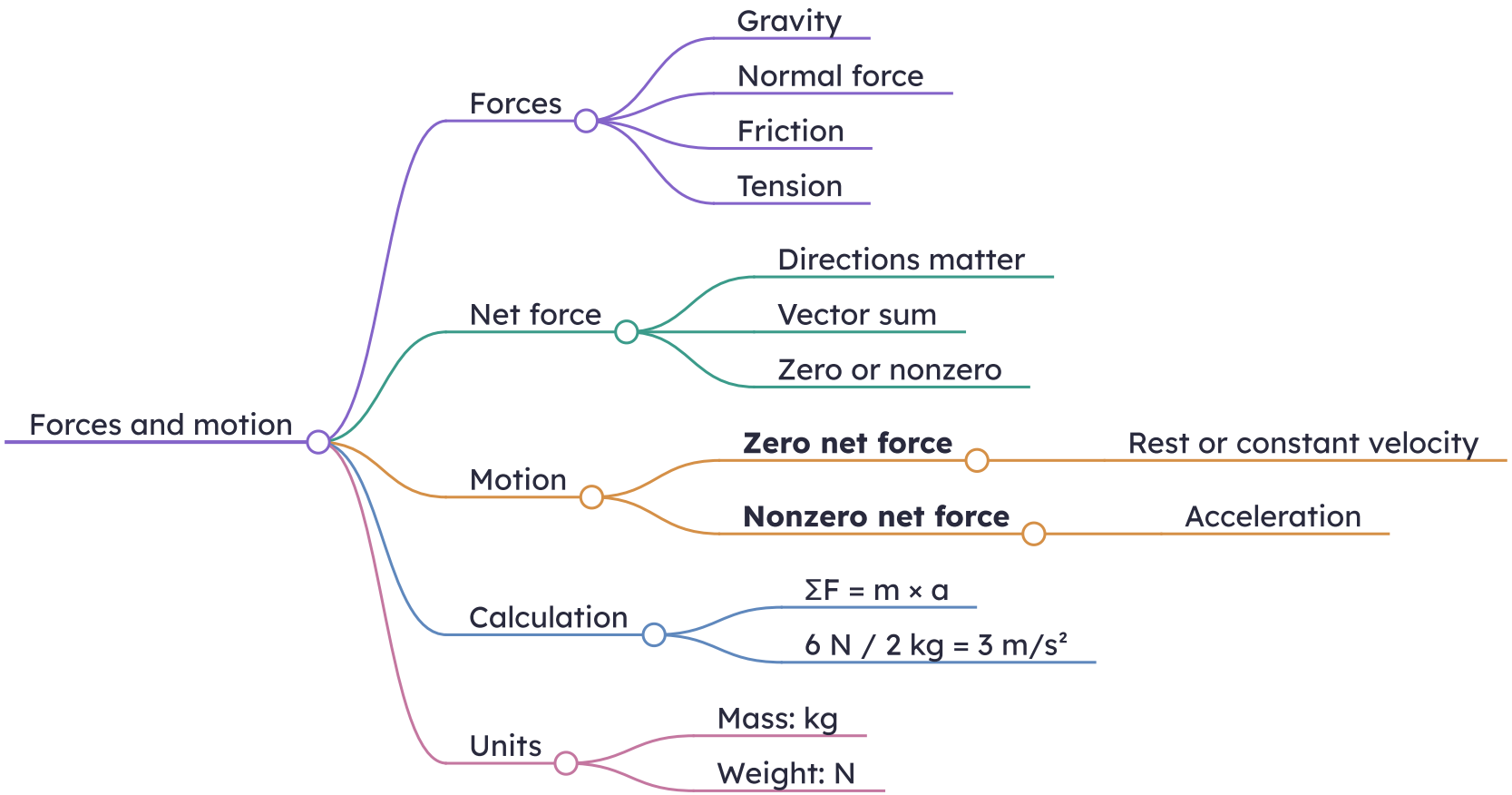
Forces and motion

Use net force to explain changes in velocity.



Read one branch at a time. Then cover the details and explain them in your own words.

Understand the topic

Forces are interactions that can change motion. For constant mass, Newton's second law relates net force to acceleration: ΣF = m × a. Zero net force permits rest or constant velocity. Mass measures inertia, while weight is a gravitational force; they use different units.

How the map is organized

Name individual forces, combine them with directions, and then predict acceleration.

> **Watch out for this**
> A moving object does not always require a net force in its direction of motion. Net force changes velocity.

Try it yourself

Draw the forces on a book resting on a table. Next calculate the acceleration of a 2 kg object under a 6 N net force.

Two questions to answer

What acceleration follows from 6 N on 2 kg?

Divide net force by mass: 6/2 = 3 m/s².

Does zero net force guarantee rest?

The object may also move at constant velocity.

Sources

openstax.org
https://openstax.org/books/college-physics-2e/pages/4-3-newtons-second-law-of-motion-concept-of-a-system

Original practice material compiled by Studera.ai. Explore at studera.ai/en/resources/mind-map-examples.