



## Equilibrium

- An object is in equilibrium when:
  - ① Its acceleration is zero
    - Not moving
    - Moving @ constant velocity
- When all the forces on an object are balanced out.



LESSON BACKGROUNDS

## Newton's second law (Adding forces)

Add up  
Direction Matters

$$\sum F = ma$$

①  $\xrightarrow{1N}$   
 $\xrightarrow{2N}$   
 $1 + 2 = 3N \text{ right}$

②  $\xrightarrow{1N}$   
 $\xleftarrow{-2N}$   
 $1 + (-2) = -1N$



LESSON BACKGROUNDS

## Reminders

$$F = ma$$

$$m = \frac{F}{a}$$

$$a = \frac{F}{m}$$

$$1 N = 1 \text{ kg m/s}^2$$



LESSON BACKGROUNDS

# Physics Learning goals: Dec 5

- 1) What is equilibrium?
- 2) Give an example of an object in equilibrium.
- 3) Can a moving object be in equilibrium?
- 4) A 2 kg tortoise is accelerating at 3 m/s<sup>2</sup>, how much force is being applied to the tortoise?
- 5) A 12 N force is applied to a 2 kg object. What will be the magnitude of the acceleration of the object?



A second screenshot of the same software interface, showing a toolbar with icons for 'NEW LESSON', 'OPEN LESSON', 'LESSON' (with a dropdown menu), 'BACKGROUND', 'SAVE', 'SAVE AS', and 'PUBLISH'. There are also buttons for a magnifying glass, a plus sign, and a play arrow.