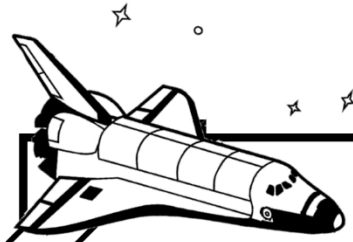


NEWTON'S 2ND LAW OF MOTION

$$f = ma$$

$$\sum f = \frac{d(mv)}{dt}$$

THE _____ OF _____ IS EQUAL TO _____ MULTIPLIED BY _____.

_____ IS PRODUCED WHEN A _____ ACTS ON A _____

FORCE
THE _____ ACTING ON THE OBJECT, MEASURED IN _____ (N)

MASS
THE _____ OF THE OBJECT, MEASURED IN _____ (KG)

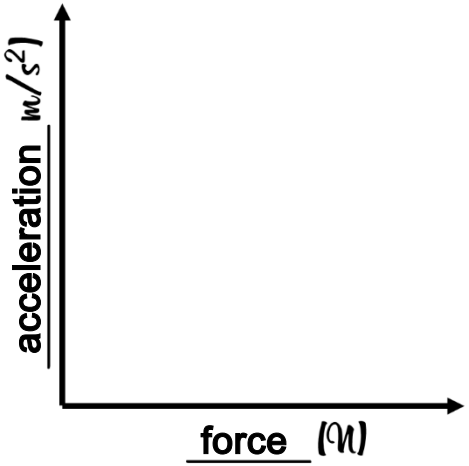
ACCELERATION
THE _____ OF THE OBJECT, MEASURED IN _____ (M/S^2)

EXAMPLE QUESTION

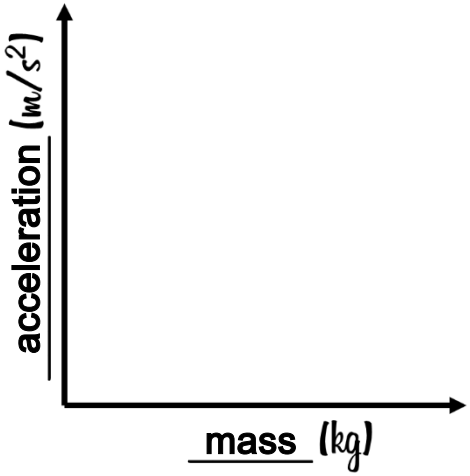
What is the force needed to accelerate a 30 kg shopping cart 3 m/s^2?

Force = **f** = ? N
Mass = **m** = _____
Acceleration = **a** = _____

when _____ is constant



when _____ is constant



THE _____
THE _____ OR _____,
THE GREATER THE _____.

DID YOU KNOW?

Mass is a measure of _____ – the resistance of an object to acceleration.

The greater the mass, the greater force required to _____ its acceleration. Therefore, acceleration is _____ to mass when the force is constant!

Checking for UNDERSTANDING

Name: Date:

NEWTON'S 2ND LAW OF MOTION

SPIN THE GEARS

Can you find the gears which won't turn?
Decide whether the following are true or false.

Newton's 2nd Law of Motion informs us that force is the product of mass and acceleration.

a

True or False? Explain.

_____

_____

b

True or False? Explain.

_____

_____

A **Newton** (N) can also be shown as kg•m/s, for example 30 kg•m/s = 30 N.

The greater the **mass**, the greater the **force** required to increase its acceleration. Eg: 20 kg is easier to accelerate than 30 kg.

c

True or False? Explain.

_____

_____

d

True or False? Explain.

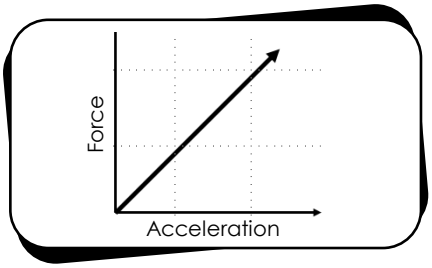
_____

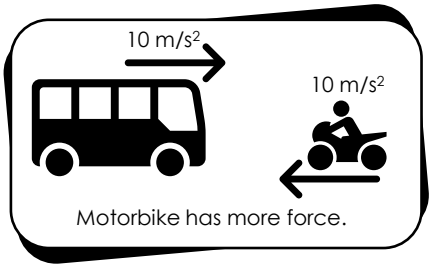
_____

Solving for **acceleration** is easy. Simply divide the mass by the force.

KNOW BY SIGHT

Can you identify anomalies?
Cross out the following non-examples or incorrect ideas.





Find the force of a 20 kg mass accelerating at 30 m/s².

F = m x a
F = 20 kg x 30 m/s²
F = 6N

✓ because... _____
✗ _____

✓ because... _____
✗ _____

✓ because... _____
✗ _____

PUZZLE IT OUT

Can you match each puzzle piece?
Connect the terms to the definitions. Watch out! One is missing!

Acceleration	A	1	A push or pull acted upon an object.	
Mass	B	2		
Force	C	3	The rate at which an object changes velocity.	
2nd Law	D	4	A measure of how much matter is in an object.	
Inertia	E	5	The resistance of change in motion.	