

Lesson 4 - Gravity

Physics - KS3

Forces and Motion

Mrs Wolstenholme



Describing Gravity

Gravity is the force of attraction between any objects with mass.

All objects have a gravitational field around them, but it is only noticeable around huge objects like stars and planets.

The force caused by the gravitational field of a planet on an object is called its **weight**.



What does attraction mean?

Option 1

Pulls objects together

Option 2

Pushes objects apart



Gravity is a force that acts on any object with

Option 1

Speed

Option 2

Energy

Option 3

Mass

Option 4

Power



Choose the true statement.

Option 1

All objects with mass have a gravitational field.

Option 3

Only large objects with mass have a gravitational field.

Option 2

Only large objects with mass have a gravitational field.

Option 4

Only elephants have a gravitational field.



Mass

How much matter an object is made of.

Does not depend on the gravitational field of the planet.

Measured in g or kg

Weight

The force of gravity on an object.

Depends on the gravitational field.

Measured in Newtons (N)



Mass is the

Option 1

Amount of force in an object.

Option 3

Force of gravity on an object.

Option 2

Amount of matter in an object.

Option 4

Force of matter on an object.



Weight is the

Option 1

Amount of force in an object.

Option 3

Force of gravity on an object.

Option 2

Amount of matter in an object.

Option 4

Force of matter on an object.



Does mass depend on where I am?

Option 1

Yes

Option 2

No



Does weight depend on where I am?

Option 1

Yes

Option 2

No



Weight measured in

Option 1

Newtons (N)

Option 2

Kilograms (kg)

Option 3

Grams (g)

Option 4

Metres (m)



Mass measured in

Option 1

Newtons (N)

Option 3

Grams (g)

Option 2

Kilograms (kg)

Option 4

Metres (m)



Independent Task

My friend told me this bag **weighs 1 kg**. Why are they wrong?

- Mass is measured in whereas weight is measured in
- Mass is Whereas weight is
- Mass does not depend on whereas weight does depend on



Investigation

What is the relationship between **mass** and **weight** on the earth?

Mass (g)	Weight (N)
100	
200	
300	
400	
500	



Investigation



Newton meter



Investigation

1. What do I use to measure the weight?
2. How much mass do I add each time?
3. Why do we check that our Newton meter reads zero at the beginning?
4. How could I make my investigation even better?



Investigation Variables

1. What is the independent variable (the one I change?)

Mass

2. What is the dependent variable (the one I measure?)

Weight

3. What are the control variables?

Newton meter, altitude, planet.



What is the independent variable in this investigation?

Option 1

Mass

Option 2

Planet

Option 3

Newton meter

Option 4

Weight



What is the dependent variable in this investigation?

Option 1

Mass

Option 2

Planet

Option 3

Newton meter

Option 4

Weight



What are two control variables in this investigation?

Option 1

Mass

Option 2

Planet

Option 3

Newton meter

Option 4

Weight



Match the type of variable to the definition:

Control

Dependent

Independent

The one we change

The one we keep the same

The one we measure



Investigation

What is the relationship between mass and weight on the earth?

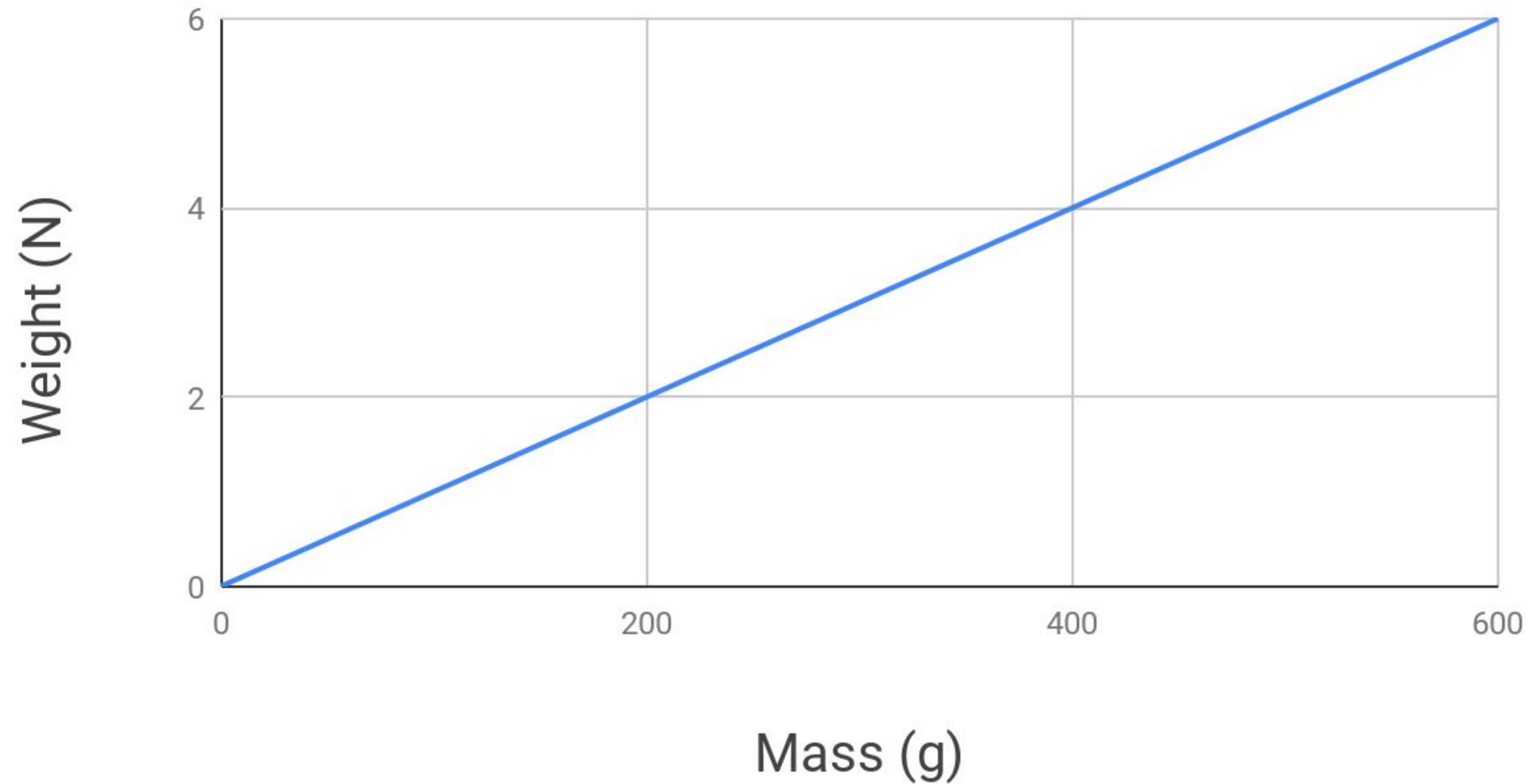
Mass (g)	Weight (N)
100	1
200	2
300	3
400	4
500	5

When the mass increases by 100 g, the weight increases by 1 N



Investigation

Weight (N) vs Mass (g)



Weight and mass are directly proportional



What do I use to measure the weight?

Option 1

Mass balance

Option 2

Newton meter

Option 3

Ruler

Option 4

Voltmeter



What does the straight line through the origin show?

Option 1

Mass and weight are similar

Option 3

Mass and weight are directly proportional

Option 2

Mass and weight are inversely proportional

Option 4

Mass and weight are friends



Independent Task

1. What is the independent variable of this investigation?
2. What is the dependent variable of this investigation?
3. What is the relationship between mass and weight on earth?
4. How did the investigation show this?



Well Done!

