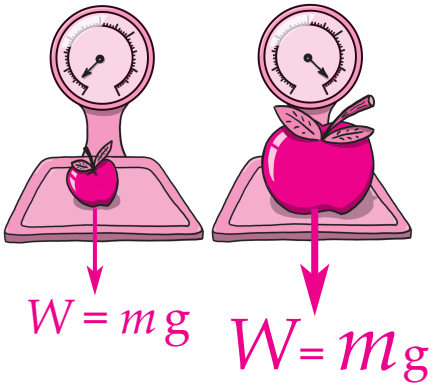
Weight

Weight is the ____-contact force of _____.

As weight is a _____, it is measured in units called _____. The symbol for the unit is __.
A medium apple has a weight of about ___.

An object's weight depends on how much stuff it contains. This is called its _____ (measured in _____ or _____). The weight also depends on the _____ of the local _____.



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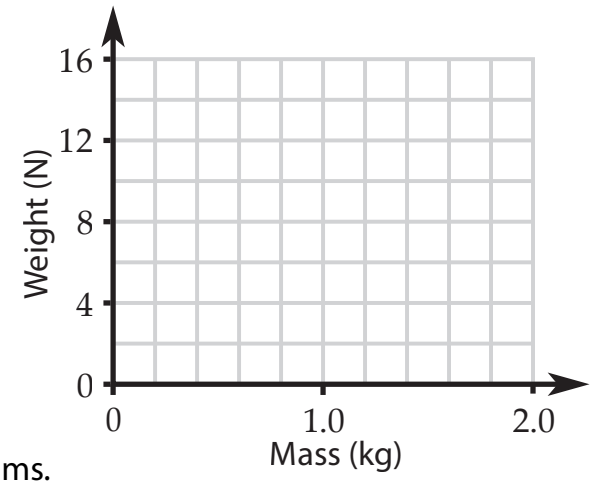
1 The weights of some objects (on Earth) are given in the table.

Object	**Mass** (g)	**Mass** (kg)	**Weight** (N)
Apple	100		1.0
Full bottle	1200		12
Rat	400		4.0
Kitten	1600		16



(a) Fill in the column with masses in kilograms.

(b) Plot a graph of weight against mass. Add a straight line of best fit.

(c) What is the weight of a 0.6 kg bag of flour? Use the graph.

(d) What is the mass of a 15 N weight? Use the graph.

On Earth, the relationship between mass and weight is

- Weight (N) = Mass (kg) ____
- Mass (kg) = Weight (N) ____

2 Calculate the weight of each mass on Earth.

(a) 2.0 kg (c) 0.8 kg (e) 540 g

(b) 3.0 kg (d) 5.4 kg (f) 30 g

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3 Calculate the mass (in kg) of each weight on Earth.

(a) 20 N (c) 250 N (e) 4 N

(b) 50 N (d) 12 N (f) 0.7 N

4 Calculate the mass (in g) of each weight on Earth.

(a) 8.0 N (b) 0.5 N (c) 0.02 N

The _____ of a kilogram depends on the strength of _____.

On Earth, one kilogram weighs 10 N.
On the Moon, one kilogram weighs 1.7 N.
On Mars, each kilogram weighs 3 N.
On Venus, one kilogram weighs 7 N.

5 What is the weight of...

(a) 5 kg on Mars?

(b) 2 kg on Venus?

(c) 50 kg on the Moon?

(d) 60 kg on Mars?

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6 How many kilograms of mass would you need to weigh...

(a) 15 N on Mars?

(b) 28 N on Venus?

(c) 34 N on the Moon?

(d) 300 N on Mars?

The _____ of each _____ is called the _____.
Its symbol is _ and it is measured in ____.

The gravitational field strength on Earth $g_{\text{Earth}} = 10$ N/kg.

7 Write down the gravitational field strength (giving the units) on

(a) the Moon (b) Mars (c) Venus

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8 Complete the word equations using **Weight**, **Mass** and g.

(a) Weight $=$ (b) Mass $=$ (c) $g =$

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9 Rewrite your word equations using symbols. W is weight and m is mass.

(a) $W =$ (b) $m =$ (c) $g =$

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10 Calculate the gravitational field strength (g) on

(a) Neptune if a 300 kg rocket weighs 3300 N.

(b) Jupiter if a 3 kg rabbit weighs 69 N.