Weight

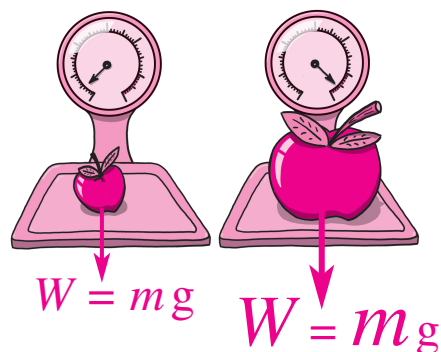**Weight** is the _____ force of _____.

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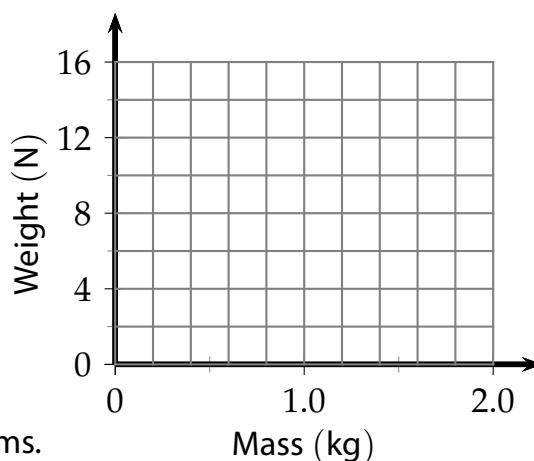A medium apple has a weight of about ___.

An object's weight depends on its _____ (measured in _____ or _____).

The weight also depends on the _____ of the local _____.

$$W = mg$$
$$W = mg$$

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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 best fit straight line

(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 rules for converting between units of mass and weight are
- Weight (N) = Mass (kg) _____
- Mass (kg) = Weight (N) _____

2 Convert these masses into weights in newtons.
   (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 Convert these weights into masses in kilograms.
   (a) 20 N   (c) 250 N   (e) 4 N

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

4 Convert these weights into masses in grams.
   (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 Mars, each kilogram weighs 3 N.
On the Moon, one kilogram weighs 1.7 N.   On Venus, one kilogram weighs 7 N.

5 What is the weight of...
   (a) 5 kg on Mars?   (c) 50 kg on the Moon?

   (b) 2 kg on Venus?   (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?   (c) 34 N on the Moon?

   (b) 28 N on Venus?   (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 $g_{Earth} = 10$ 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.