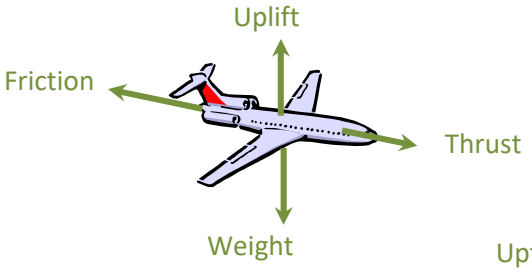
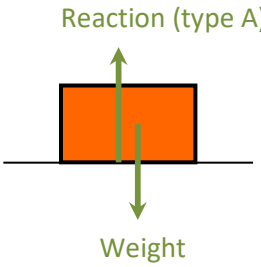
Worksheets

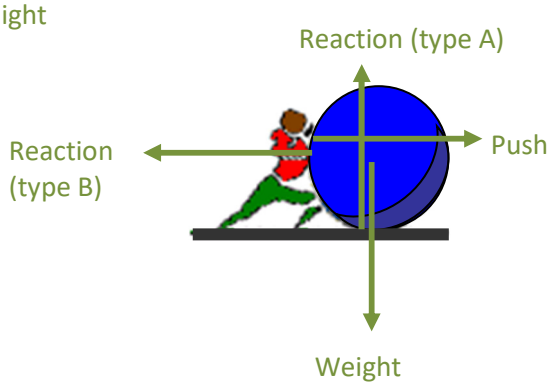
# Types of Forces

There are many different types of forces. Some of them are shown in the pictures below.







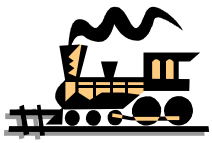

## 1. Force definitions

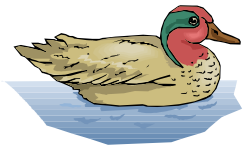
Match each type of force with its description.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Weight | • | • | a | The force of the ground holding something up. |
| 2 | Reaction (type A) | • | • | b | The force pushing something forward. |
| 3 | Reaction (type B) | • | • | c | The force of water pushing upwards. |
| 4 | Thrust | • | • | d | Gravity acting downwards on an object. |
| 5 | Friction | • | • | e | The force of an object pushing back against you. |
| 6 | Uplift | • | • | f | The force acting against any movement. |
| 7 | Buoyancy/Upthrust | • | • | g | The force that lifts things up in air. |

## 2. Adding Forces

Draw forces on these two objects.

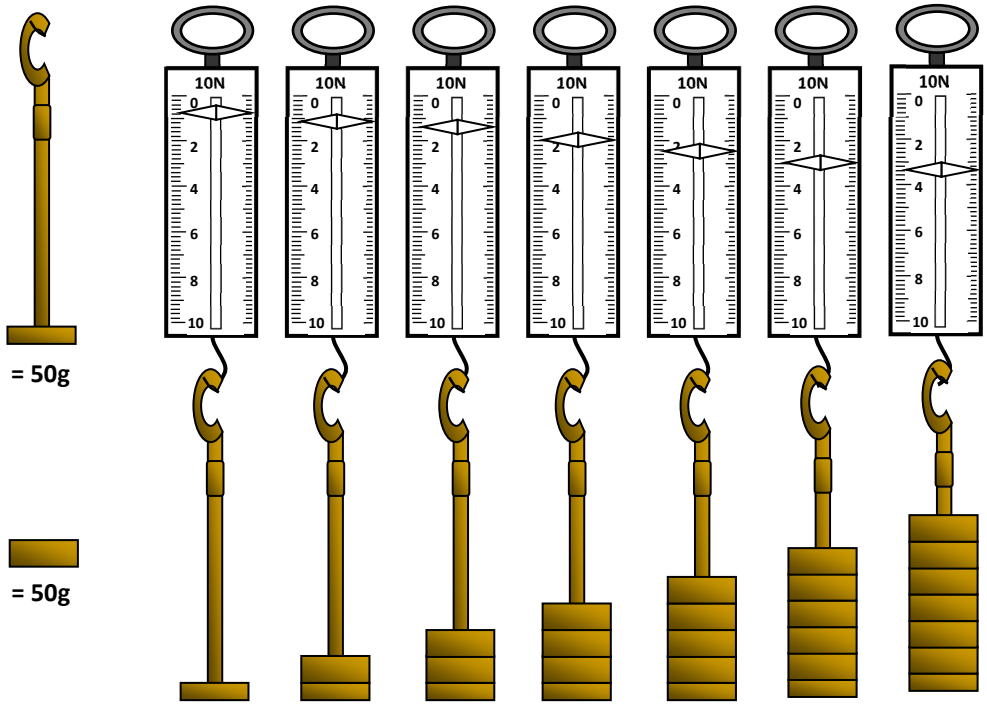




Practical Alternatives

# Mass and Weight

Vicky wanted to find out the relationship between mass and weight. She used a force meter to measure the weight of a variety of different masses. The results of her experiment are shown.




## Fact File

Mass is a measure of the amount of 'stuff' that something is made of.

Weight is the force downwards on a mass due to gravity.

A 1Kg mass weighs about 9.81N. It is common to use a rounded value of 10N.

Mass remains the same everywhere, whereas the weight of an object depends on gravity.

## Tasks

1. Design and complete a table showing the results of the experiment. Your table should include the total mass used and the weight shown on the force meter. Leave a third column free on the right.
2. Plot a line graph showing *weight* (y-axis) against *mass* (x-axis). Draw a straight line through the points.
3. Calculate the *newtons per gram* for each result in your table (divide the weight by the mass). Write the calculated numbers to the spare column. Work out the average value for this column.
4. Use your *average newtons per gram* from the last question to calculate the weight of a 1Kg mass. Remember that 1Kg = 1000g.
5. If you know how to, then measure the gradient of your graph. Make some conclusions about this value.
6. This experiment helped estimate the weight of a 1Kg mass on Earth. Find out the exact value on Earth and the weight of the same mass on the Moon and on the other planets in the solar system.

## Key Words

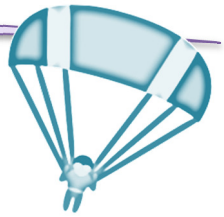
Mass. Weight. Force meter. Gravity.

## ☑ Checklist for this activity

☐ Work on the sheet/in the file ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
☐ Write full answers ☐ Copy the *Fact File*
☐ Copy the diagrams ☐ Add your own research

Plenaries

# Stopping Distances



## Stopping Distances

| distance | stopping | speed | wet | brakes | harder | time |
|---|---|---|---|---|---|---|

Speed is a measure of the _____ travelled in a certain _____. The higher the _____ with which a car is moving, the _____ it is to stop. The distance travelled by a car as it is braking is called the _____ distance. The stopping distance also increases if the road is greasy, _____ or smooth, or if the _____ are worn. This is because there is less friction acting against the movement.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Vocab Busters

# Forces

| | Vocab |
|---|---|
| 1 | Contact forces |
| 2 | Non-contact forces |
| 3 | Attraction |
| 4 | Weight |
| 5 | Reaction |
| 6 | Buoyancy |
| 7 | Friction or Drag |
| 8 | Air-resistance |
| 9 | Stretch |
| 10 | Compress |
| 11 | Balanced forces |
| 12 | Unbalanced forces |
| 13 | Resultant force |
| 14 | Distance |
| 15 | Speed |
| 16 | Pressure |
| 17 | Snowshoes |
| 18 | Ice skates |
| 19 | Air pressure |
| 20 | Moment |
| 21 | Pivot |
| 22 | Lever |
| 23 | Pliers |
| 24 | Pulley |
| 25 | Force magnifier |
| 26 | Distance magnifier |

| | Explanation |
|---|---|
| a | A force that pulls objects together. |
| b | 'Touch' forces such as push and pull. |
| c | Forces like gravity that act through empty space. |
| d | The force that acts to slow objects down. |
| e | The force felt when an object is placed in water. |
| f | This force pulls a spring apart. |
| g | The force of gravity that makes things heavy. |
| h | Friction caused by the atmosphere. |
| i | The force that stops you falling through the floor. |
| j | How far an object moves (measured in m, or km). |
| k | The overall sum of a number of forces. |
| l | Forces that cancel each other out. |
| m | To squeeze something so that it is smaller. |
| n | Forces that do not cancel each other out. |
| o | The force acting over an area. |
| p | Footwear designed to decrease pressure. |
| q | Footwear designed to increase pressure. |
| r | How fast something moves. |
| s | The point round which an object can rotate. |
| t | The pressure caused by the Earth's atmosphere. |
| u | A simple machine that uses a pivot. |
| v | The turning effect of a force. |
| w | A machine that increases the distance moved. |
| x | A machine that increases the size of a force. |
| y | An example of a lever. |
| z | A machine that uses ropes. |

**Vocab-busters**

These tasks could be used as pre-topic assessments, checklists to cross off as ideas are taught, or revision tools.