

### Teacher Information: understanding mass & weight

For generations, we learned to talk about *weight*, which was measured in pounds, ounces and so on. Since the adoption of metric units, we now correctly refer to an object's *mass*, measured in units based on the kilogram.

- The **mass** of an object does not change with its location, and is a constant measure of the matter that makes it up.
- **Weight**, on the other hand, varies with the force of gravitational attraction, and is a measure of this force. Astronauts in space may have a weight that is zero, yet their masses will be unchanged.

Older students may like to research "weightlessness" and its effects on travellers in space.

**Intended Learning Outcomes:** At the conclusion of this activity, students will have

- Correctly chosen metric units for measuring mass, appropriate for the measuring context and purpose
- Record
- Estimate
- accurate

**Familiarity**

1. Discuss "weight"
2. Ask students many unlabeled why you



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figure out

<ul style="list-style-type: none"> <li>• gram</li> <li>• kilogram</li> <li>• tonne</li> <li>• milligram</li> </ul>	..... ..... ..... .....	<ul style="list-style-type: none"> <li>g</li> <li>kg</li> <li>t</li> <li>mg</li> </ul> <p style="color: red; font-style: italic; font-size: small;">Some possible alternatives</p>	..... ..... ..... ..... ..... .....	<ul style="list-style-type: none"> <li>• ounce</li> <li>• pound</li> <li>• stone</li> <li>• hundredweight</li> <li>• ton</li> </ul>	..... ..... ..... ..... ..... .....	<ul style="list-style-type: none"> <li>oz</li> <li>lb</li> <li>st</li> <li>Cwt</li> <li>T</li> </ul>
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For lists of other metric and Imperial/US customary units, see Wikipedia:

- [https://en.wikipedia.org/wiki/International\\_System\\_of\\_Units](https://en.wikipedia.org/wiki/International_System_of_Units)
  - [https://en.wikipedia.org/wiki/United\\_States\\_customary\\_units](https://en.wikipedia.org/wiki/United_States_customary_units)
3. Explain to students that most countries in the world now use units that are in List A, called the Metric units of measure for mass. In Australia, we do not use units in List B for official purposes, and students do not need to learn them.
  4. Explain that the Imperial unit the "ton" and the metric unit the "tonne" are very similar and can be thought of as nearly the same mass. The metric unit is pronounced "tōn", with a short "o" to rhyme with the word "gone".

**1 L of water has a mass of 1 kg**  
**1 g of water has a volume of 1 cm<sup>3</sup>**

**Student's sheet**

Which units of measure for mass (weight) have you heard before?  
Write the units in the two lists when your teacher instructs you to:

List A	List B
abbreviation	abbreviation



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**Revision**

- 1) Label \_\_\_\_\_.
- 2) Where \_\_\_\_\_
- 3) Weight \_\_\_\_\_ almost.  
Mark \_\_\_\_\_ es not.
- Weight \_\_\_\_\_
- Astro \_\_\_\_\_
- Man on the moon \_\_\_\_\_
- Measuring butter for a recipe \_\_\_\_\_
- 4) If you have heard people using Imperial units, which ones were they using, and in what context (e.g. US weight loss shows, baby birth weight)? Why do you think that is? \_\_\_\_\_  
\_\_\_\_\_
- 5) Write the relationship between the metric units:  
1 L has a mass of \_\_\_\_\_ kg of water      1 g of water = \_\_\_\_\_ cm cube (cm<sup>3</sup>)
- 6) Research question: The French, who devised the metric system, originally wanted the base word for mass to be "grave" based on the word gravity. They chose another word instead. What is it and how was it spelt? \_\_\_\_\_  
How do we spell it now? \_\_\_\_\_

### Student's sheet

Which units of measure for mass (weight) have you heard before?  
Write the units in the two lists when your teacher instructs you to:

List A	Metric	List B	Imperial
	abbreviation		abbreviation
gram	g	once	oz
kilogram	kg	pound	lb
tonne	t	stone	st
milligram	mg	hundredweight	cwt
		ton	t or T



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### Revision

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- Measuring butter for a recipe \_\_\_\_\_
- 4) If you have heard people using Imperial units, which ones were they using, and in what context (e.g. US weight loss shows, baby birth weight)? Why do you think that is? \_\_\_\_\_  
answers will vary

People are familiar with these measures which have been handed down from generation to generation.

5) Write the relationship between the metric units:

1 L has a mass of 1 kg of water      1 g of water = 1 cm cube (cm<sup>3</sup>)

6) Research question: The French, who devised the metric system, originally wanted the base word for mass to be "grave" based on the word gravity. They chose another word instead. What is it and how was it spelt? gramme

How do we spell it now? gram