 Do supermarkets lie?

Part A: Measure weight of supermarket items

By law, the weight of an item must be recorded on its packaging, but is it correct?

1. Choose 10 items that have not been opened. Ensure that the items are weighed in the same units, for example sugar and rice are weighed in kg.
2. Use weighing scales to weigh each item and record them in the table below.
3. Fill in a table similar to Table 2 below to show the listed and actual weight of each item
4. Record using positive and negative numbers to show whether the actual weight was above or below the listed weight

**Table 1 - Listed and actual weight of each item**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item name** | **Listed weight** | **Actual weight** | **Difference** |
| Peanut Butter | 250g | 240g | -10g |
| Sugar | 1kg=1000g | 1.01kg=1010g | +10g |
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Part B: Validating weight of supermarket items

Legally a product is allowed to be slightly over or slightly under its listed weight. Table 2 below shows the percentage over or under allowed for items by weight

**Table 2 – Percentage over or under allowed for items by weight**

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| --- | --- |
| **Weight** | **Percentage over or under** |
| 0 – 100g | 9% |
| 100 – 300g | 4.5% |
| 300 – 500g | 3% |
| 500 – 1 000g | 2% |
| 1 000 – 15 000g | 1.5% |

Source: [Australian Government; Industries](https://www.industry.gov.au/sites/default/files/2019-04/guide-to-the-average-quantity-system.pdf)

Example: What is the range of legal weights for a 75g packet of chips?

Since the weight is between 0 and 100 g, it can be over or under by 9% according to the table.

* Convert 9% to a decimal = 9 100 = 0.09
* 75 x 0.09 = 6.75 (greatest possible error)
* Minimum weight = 75 – 6.75 = 68.25g
* Maximum weight = 75 +6.25 = 81.75g

1. For each of your items chosen, calculate the minimum and maximum weights that are allowed (use the example above for help with the calculations). Create a table using the column headings as shown in Table 3 below to record your results.

**Table 3 – Percentage over or under allowed for items by weight**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item name** | **Listed weight** | **Percentage over or under** | **Decimal over or under** | **Greatest possible error** | **Minimum weight** | **Maximum weight** |
| Chips | 75g | 9% | 0.09 | 0.09 x 75  = 6.75 | 75 – 6.75  = 68.25g | 75 + 6.75  = 81.75g |
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1. List the items that are:
   * within the legal limits
   * outside of the legal limits
2. Write a response to “Do supermarkets lie?” using evidence from your investigation

Outcomes

* MA4-2WM applies appropriate mathematical techniques to solve problems
* MA4-3WM recognises and explains mathematical relationships using reasoning
* MA4-4NA compares, orders and calculates with integers, applying a range of strategies to aid computation
* MA4-5NA operates with fractions, decimals and percentages
* MA3-12MG selects and uses the appropriate unit and device to measure the masses of objects, and converts between units of mass