

## Developing proportional reasoning through tax and super tasks

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### Year 8 - Can a sugar tax lower rates of obesity?

#### Curriculum connections

*Statistics and Probability: Data representation and interpretation*

- Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly from secondary sources (VCMSP324).
- Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (VCMSP326).

#### Mathematical focus

Data representation and interpretation are important skills in our information-rich technological world. Data can be shared in tables or charts (e.g., bar charts, pie charts, line graphs, box and whisker plots, and scatterplots). It is important to read the title of a graph and the name on each axis to ensure accurate interpretation, but further background might also be needed for a meaningful interpretation. For example, in a percentage change graph, we can only determine the size of the change and there is no detail about the size of the initial value nor final value. So, a large change in a relatively small market might not be significant in terms of economic impact or behavioural change.

Here are two methods to calculate the percentage change:

$$\% \text{ change} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} \times 100 = \frac{\text{New Value}}{\text{Old Value}} \times 100 - 100$$

**Key language:** Introduce or revise such terms as *tax*, *excise*, *rate*, *consumption*, *sales volume*, *categories*, *estimate*, and *prediction*.

#### Learning task

Taxes can be used to increase the cost of particular products so as to discourage people from buying them. In Australia, such excises apply to the manufacture of cigarettes and alcohol.

Since around 28% of Australians are overweight or obese, the Australian Medical Association has suggested that the Federal Government should apply a “sugar tax” to sugar-sweetened beverages such as soft drinks. A sugar tax would increase the cost of these drinks with a view to reducing their consumption and rates of obesity.

A sugar tax was introduced in the UK in 2018. Figure 1 shows the estimated impact on sales volumes of various categories of drinks (Oxford Economics, 2016).

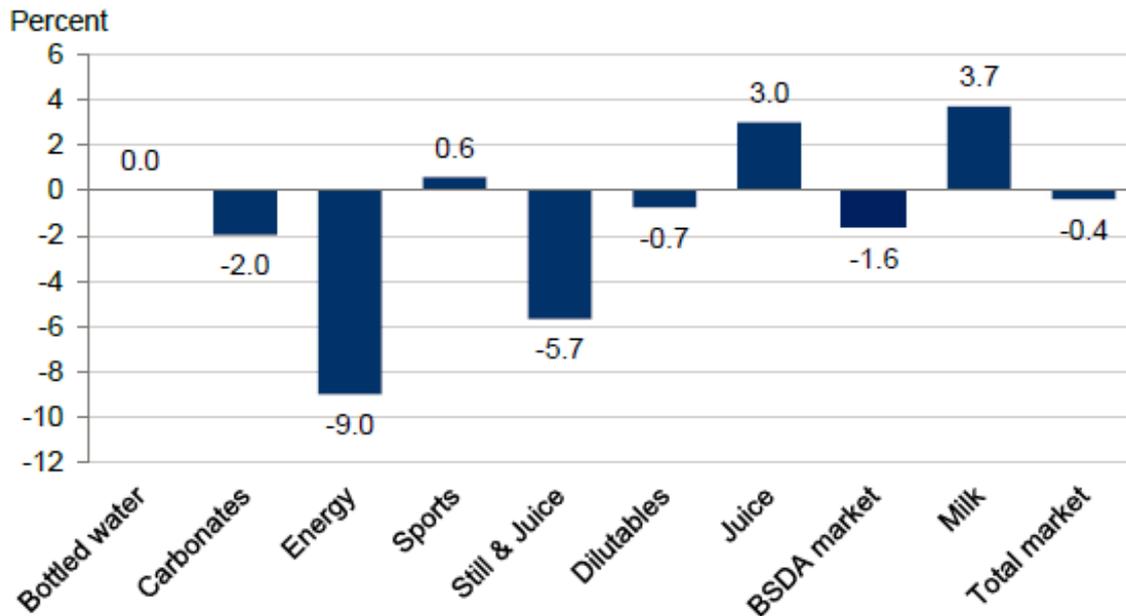


Figure 1. Estimated impact on sales volumes by drinks category (Oxford Economics, 2016).

A recent survey of UK shoppers found that 62% say they have not changed the amount of sugary drinks they purchase in any way since the introduction of the sugar tax (Ceylan, 2018). However, manufacturers have been researching and developing products that contain significantly less sugar, meaning most soft drinks sold now actually fall below the sugar tax threshold (Pym, 2018).

1. Refer to the data above to write three simple statements of fact. For example, what was predicted might happen and what has actually happened in the UK?
2. Do you think a sugar tax could work to lower obesity rates in Australia? Why / why not?
3. If an Australian political party proposed a sugar tax as part of their election campaign, would you vote for them? Why / why not?

**Enabling prompts:**

- Which products had the biggest decrease in sales volume?
- Which products had the biggest increase in sales volume?
- Which products do you think are less healthy?
- Which products do you think a government could justifiably tax?
- Which products do you think a consumer would still drink even if the price went up?

**Extending prompts:**

- Gather data on current and historical drinks sales volume and sales value in Australia and which, if any, of these drinks are taxed. How could you communicate this data to others?
- Gather price data for an example of each type of drink category. What would be a meaningful way to compare the prices? Collect data from classmates to determine what magnitude of price increase would deter them from purchasing the drink.

**Important pedagogical considerations**

- Invite students to share what they know and understand about tax. They may be working and therefore paying tax.
- Make sure students record their mathematical working and their explanations.
- Ask students to convince you that their solutions are mathematically sound.
- Remind students to check the appropriateness of their solution against the problem, as well as any potential impact on individuals, families, communities and society.

**Student handout**

If you would like to use a student handout for this task, please print out the next page.

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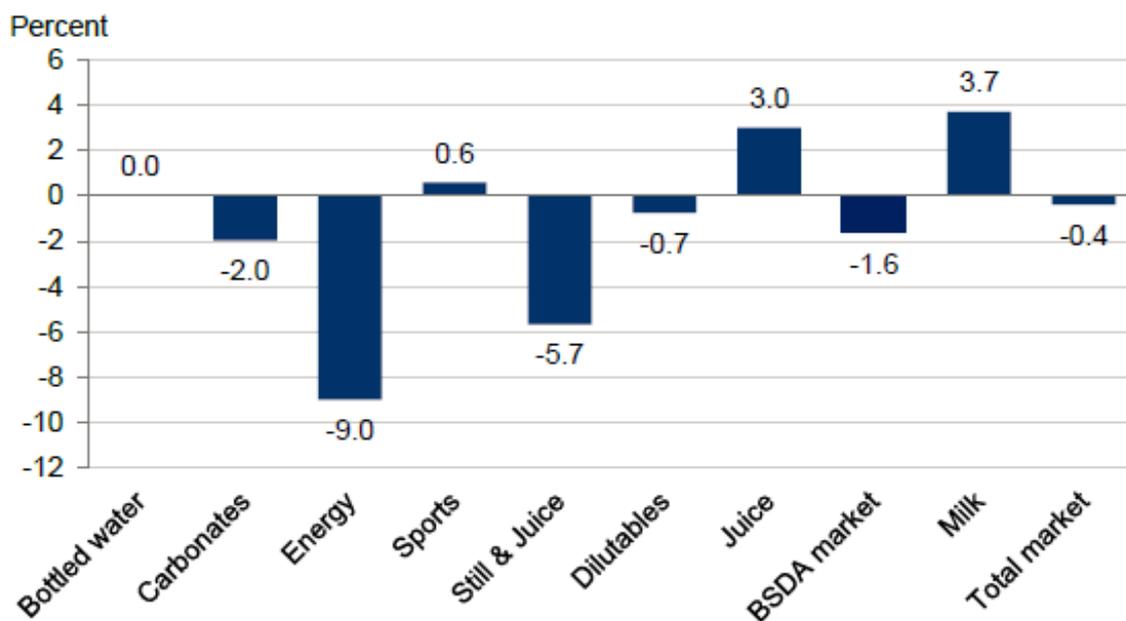


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