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For more activities refer to the Schools Corner section of the Statistics New Zealand website:

www.stats.govt.nz/schools-corner

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Curriculum links

Economics:

Statistical skills

- The relevant statistical skills for this achievement standard are listed in level three (year 12) in *Economics, Forms 3 to 7: Syllabus for Schools*, Learning Media, Ministry of Education, 1990, p11.

Using the HES to re-weight the CPI

In this edition we are focusing on the Household Economic Survey (HES) and how it is being used to assign new weights to the expenditure items in the Consumers Price Index (CPI). This information supports internally assessed Achievement Standard 90797 (2.4) – Process, present and analyse statistical data in relation to given economic issues.

The purpose of the activities is to provide teachers with examples of how to use the Household Economic Survey and Consumers Price Index in support of an internally assessed achievement standard.

Students should already be familiar with price indexes and the CPI.

For more information teachers and students can visit our website www.stats.govt.nz, then:

- select datasets
- select economic indicators
- select consumers price index
- then go to survey information.

A web-based activity is included to test prior knowledge of price index calculation. A second web-based activity is also included where HES nominal expenditure data can be applied to the price index calculation activity. This is quite useful since it shows the effect of the latest HES expenditure data on the price index.

The activities in this edition will ask students to process and present statistical data on expenditure patterns of households and price index statistics.

The activities require students to analyse the HES data and graph their findings. As part of the economic analysis, students will explain their findings. Students will also apply the HES data to the CPI to re-weight the indexes.

Did you know...

Periodic reviews of the CPI are undertaken to ensure that it remains relevant and up to date. The following items were removed from the CPI regimen (basket of goods to be priced) in the most recent review in September 2006: takeaway soup, sherry, knitting needles, refrigerator (refrigerator/freezers remain in the basket), clothes line, dermatology cream, television repair, atlas, hairspray, store-card fees.

Source: *Information paper - Consumers Price Index Review September 2006 (revised)*

Teachers page

Prior knowledge

Students should already be familiar with:

- The calculation of a simple weighted price index with two goods only. A web-based activity is included to test this knowledge. To calculate an index a base period (in this case Monday) is needed to enable a comparison to be made between the base period and the current period. The base period (Monday) is set to 1,000 (or 100 or 10 whatever you choose) – in New Zealand we choose 1,000 to be more precise. The formulas to use for this activity are:
 - Nominal expenditure:
Price x quantity
 - Total nominal expenditure:
(Price x quantity) + (Price x quantity)
 - Index calculation:
$$\frac{\text{Current period price} \times \text{Base period index value}}{\text{Base period price}}$$
- The Consumers Price Index (CPI) which is used to measure the changes in the prices of all goods and services purchased by New Zealand households over a period of time.
- The Household Economic Survey (HES). More information can be found on our website: www.stats.govt.nz/HES. An activity is included to analyse the HES data.

Activities answers

Activity 1: Analyse the HES data

- Total gross expenditure is a summation of the expenditure groups that adds up to \$80,181.227 million.
- Use the following formula to calculate the proportion of total net expenditure figures:
(Nominal expenditure of specific expenditure group ÷ Total net expenditure) x 100.

Example:

(Nominal food expenditure ÷ Total net expenditure) x 100.

Therefore (12,729.625 ÷ 78,233.132) x 100 = 16.27 percent.

- Model answer:

Households spend most of their income on housing and household utilities. This is because house repayments and rentals are very high in comparison to other expenditure items. Electricity and house maintenance services are also included in this group and expenditure on both these items is also very high.

Activity 2: Re-weighting the CPI

- Use the following formula to reweight the expenditure groups in the CPI using the HES expenditure groups.
(Nominal expenditure of specific expenditure group/Adjusted total net expenditure(1)) x 100.
(1) Adjusted total net expenditure = Total net expenditure – sales, trade-ins and refunds – other interest not included in CPI – other expenditure not included in CPI.

Example:

(Nominal food expenditure/Adjusted total net expenditure) x 100.

Therefore (12,729.625 ÷ 75,727.319) x 100 = 16.81 percent.

- Use the following formula to reweight the “Housing and household utilities group”

((Nominal expenditure of “housing and household utilities” + “mortgage interest”) ÷ (Adjusted total net expenditure)) x 100.

Therefore (18,317.652+5,449.249) ÷ (75,727.319) x 100 = 31.38 percent.

Using the HES to calculate base period weights for the CPI

Prices in the CPI are weighted according to their importance in the basket of goods and services that is used for the Consumers Price Index (CPI). Data in the published CPI weights comes from a variety of sources independent of the main source of weights (HES), including retail trade statistics, the census, building consents, data from the national accounts and a variety of government and industry sources. Nominal expenditure from the HES is used to calculate the importance of the item in the basket of goods and services (also called the base period weight).

The CPI is reweighted approximately once every three years to ensure that the expenditure weights allocated to the basket of representative goods and services continue to reflect the relative importance of goods and services acquired by households for consumption purposes.

Activity 1: Analyse the HES data

1. Refer to table 1 below and calculate the total gross expenditure figure, in the space provided.
2. Refer to table 1 below and calculate the proportion of total net expenditure figures, in the space provided. The first one has been done for you.

Table 1

Aggregate Annual Household Expenditure
By expenditure group⁽¹⁾
Year ended 30 June 2007

Expenditure group	Nominal expenditure (\$ millions)	Proportion of total net expenditure (Percent)
Food	12,729.625	16.27
Alcoholic beverages, tobacco and illicit drugs	2,171.563	
Clothing and footwear	2,680.502	
Housing and household utilities	18,317.652	
Household contents and services	4,140.128	
Health	1,849.980	
Transport	11,130.328	
Communication	2,556.090	
Recreation and culture	7,912.902	
Education	1,027.526	
Miscellaneous goods and services <ul style="list-style-type: none"> • Personal goods and services including personal and health insurance - \$5,260.135m • Housing, contents and combination insurance - \$1,344.357m • Vehicle insurance - \$743.608m • Credit services - \$361.770m 	7,709.870	
Other expenditure <ul style="list-style-type: none"> • Mortgage interest - \$5,449.249m • Other interest not included in CPI - \$623.618m • Other expenditure not included in CPI - \$1,882.195m 	7,955.062	
Total gross expenditure		
Sales, trade-ins and refunds	-1,948.095	
Total net expenditure⁽²⁾	78,233.132	100

(1) The expenditure classification used is the New Zealand Household Expenditure Classification (NZHEC).

(2) Total net expenditure refers to net of refunds, sales and trade-ins. Expenditure is reported as gross expenditure and includes GST.

3. Use the data from table 1 to draw a bar graph showing each expenditure group as a proportion of total net expenditure.
4. Identify which expenditure group households spend most of their income on and explain why this may be the case by referring to what is included in this expenditure group. Refer to www.stats.govt.nz/HES for more information about the items in the HES.

Activity 2: Re-weighting the CPI

Use the information from table 1 above and calculate the estimated⁽¹⁾ new CPI weights for the June 2007 quarter in the space provided in table 2 below. The first one has been done for you. For more information about the items in the CPI refer to our website www.stats.govt.nz and search CPI September 2006.

Table 2

Consumer Price Index Expenditure weights Group

Group	Estimated expenditure weights June 2007 quarter ⁽¹⁾ (Percent)
Food group	16.81
Alcoholic beverages and tobacco group	
Clothing and footwear group	
Housing and household utilities group ⁽²⁾	
Household contents and services group	
Health group	
Transport group	
Communication group	
Recreation and culture group	
Education group	
Miscellaneous goods and services group ⁽³⁾	
All groups	100.00⁽⁴⁾

- (1) The estimated weights are derived from the June 2007 HES only. The actual weights in the CPI will be different because the weights are calculated on a lower level using a different methodology. Data in the published CPI weights also comes from a variety of sources independent of the main source of weights (HES), including retail trade statistics, the census, building consents, data from the national accounts and a variety of government and industry sources.
- (2) The housing group in this activity includes "mortgage interest" from the HES; as well as "housing and household utilities" from the HES which includes principle mortgage repayments – this is done to estimate the value of new housing which is included in the CPI but not the HES.
- (3) The miscellaneous goods and services group includes personal care, personal effects, insurance, credit services etc.
- (4) The total for All groups excludes other interest and other expenditure. The sum of the weights will not sum to 100.00 because of rounding.