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# A Teaching Kit


Canada


# Canada's Consumer Price Index

**Business, Provincial and Municipal Relations Division**
**in consultation with Prices Division**

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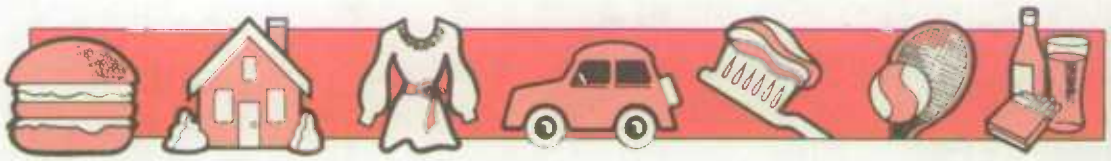

# Canada's Consumer Price Index

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Worksheets and answers are at the end of each section

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## A. How the CPI Affects Our Lives

*** (See Teacher Notes A1, A2 & A3)**

"Inflation; Has battle been won?", "City inflation losing steam", "Consumer prices drop".

You will have noticed headlines like these in the news each month commenting on the release by Statistics Canada of the latest Consumer Price Index for Canada or your city. Anything which regularly receives so much publicity must be considered to be important to most Canadians, but what exactly does the Consumer Price Index measure? How is it calculated? Most important, what effect does it have on our everyday lives?

We are all aware that the prices of the goods and services we buy are always changing, and usually in an upward direction. You may have heard your parents reminisce about the "olden days" when chocolate bars cost a mere 10¢. It's likely that you yourself can give examples of recent dramatic increases in the price of, for example, movie tickets or sports equipment which directly affected your own spending.

As prices rise, no doubt you feel the need for a larger income. You may want to ask for an increase in your wages or your allowance, or to charge more for occasional babysitting or snowshovelling. How would you decide what was fair to ask? If you had a way of calculating the percentage by which the prices of items you regularly buy have risen, then you could reasonably ask for the same percentage increase.

On a larger scale, the Consumer Price Index is a way of measuring percentage changes over time in the prices of the goods and services which are actually used by the average urban Canadian family.

The result of this measurement directly affects you and members of your family. For example, many workers in Canada have a clause in their contracts, the COLA or Cost of Living Adjustment clause, which automatically grants them an increase in income according to the percentage or point change in the Consumer Price Index. Alimony and child support payments may also be linked to these changes. Governments use the index when formulating new economic policies or measuring the success of old ones. The federal government, for instance, has used the index as a measure when making adjustments in family allowances, unemployment insurance benefits, old age security payments and personal exemptions in income taxes.

*** (See Teacher Note A4)**

(A1) Try to introduce the topic towards the middle of the month when the CPI Bulletin is released. The wide publicity that this receives on television and in the newspapers should make students aware of the national importance of the index and encourage them to want to find out in what ways it affects them personally.

The most up-to-date information on the CPI is available from your local library and the nearest Statistics Canada Regional Office. A list of Regional Offices is given on page 14.

(A2) Set up a bulletin board and encourage students to bring in headlines, articles, editorials, cartoons, etc. relating to the CPI for display in the classroom. If you are interested in having students participate in a term-long class project, please turn to the Student Price Index component of this kit.

(A3) Ask students to define the word "index". What is the index finger? the index in a book? a forest fire index? Bring out the idea that it is a pointer, or indicator.

(A4) A transparency here shows how personal exemptions for income taxes were linked to changes in inflation as shown by the CPI in the years 1974, 1975, 1976, and 1977.

Students could visit the library, call local unions, etc., to find similar links between the CPI and their own family budget.

(A5) A transparency shows Chart 1 from the March, 1983 CPI Bulletin.

You could ask why there are more fluctuations in prices for food than for other items.

Another transparency shows by contrast the annual rate of inflation (average 2.5%), between 1950 and 1955.

(A6) Students should enjoy discussing the Eaton's catalogue poster. Which items are no longer available? Which items are now made of synthetic fibres rather than cotton or wool? Are any items virtually unchanged since the year of the catalogue? Answering these questions will prepare the class for the discussions of item selection and item quality which follow in Sections B and C.

It might be interesting to compare 1927 prices with current prices for similar items. How do they compare if you take into account the different earnings in the different years?

An industrial labourer in 1927 earned on average .41¢ an hour. How many hours of work would be necessary for him to buy one of the items on the poster? His counterpart in 1981 earned on average $7.69 an hour. How many hours of work would be necessary for him to buy a similar item today?

This exercise could lead to interesting discussions on changing standards of living, technological advance, and the purchasing power of the dollar.

N.B. Using 1981 as the base year, (i.e. 1981 = 100), the CPI in 1927 was 18.3.

(A7) Please see Worksheets immediately following Section A.

Most western countries have an index which measures price changes in consumer goods and services. In Canada the CPI is the official measure of inflation. Inflation is the name often given to the sustained rise in the general level of prices which results in the diminishing purchasing power of the dollar.

Through the 1970's we lived with steeply rising prices, but it is important to know that this has not always been the case. For instance, the average annual rate of change in the CPI was 2.5 per cent over the period 1950-1955, and only 1.9 per cent over the period 1955-1960.

*** (See Teacher Note A5)**

In the next sections we shall be finding out what the CPI measures and how it is calculated. Then we can begin to understand what the headlines mean.

*** (See Teacher Notes A6 and A7)**

## Answers

**A. How the CPI Affects Our Lives**

1) (i) These can be obtained from the most recent CPI Bulletin or
   (ii) from news releases.
2) Refer to the section on COLA clauses in the text.
3) Refer to the section on COLA clauses, family allowances, income tax exemptions, etc. in the text.
4) No. It means that annual prices are rising less steeply than before.

## Questions

**A. How the CPI Affects Our Lives**

1) What was the all-items CPI last month,

   (i) for Canada?

   (ii) for a city in your province?

   Write a sentence explaining what these figures mean.

2) How do unions use the CPI in their contract negotiations?

3) Describe ways in which a change in the CPI might affect your family's income.

4) If the newspaper headlines read: "Inflation Down", does this mean that prices have dropped?

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## B. The CPI – What Does It Measure?

(B1) A transparency shows the official definition of the CPI.

The official definition states:
"The CPI measures the percentage change in the cost of purchasing a constant basket of goods and services representative of Canadian urban households in a specified time period."

*** (See Teacher Note B1)**

(B2) Students should now be interested in discussing the poster showing the average annual price indexes for various items in 1971, 1976 and 1982.

Which indexes have jumped dramatically? What possible explanations could there be? Have any indexes fallen? What possible explanations could there be?

In any month the Consumer Price Index expresses the current cost of the goods and services in the market basket as a percentage of the cost of the same items in a "base year" which is given the value 100. If the total cost for the items has fallen since the base year by 5%, then the index will be 95. If the total cost for the items has risen by 35%, then the index will be 135. The time base year usually remains constant for 10 years. At present it is 1981.

*** (See Teacher Note B2)**

### Filling the Basket

(B3) It may be of interest to discuss whether the target group will give adequate information about the spending habits of special groups, for example groups away from the cities, and in the north. Do the students feel that their own family's spending habits are represented?.

A transparency shows the comparison between the standard CPI and the low-income CPI published by Statistics Canada between 1978 and 1982

It's rare that two people spend their money in exactly the same way. If the students in a class were each given $20, for instance, one might spend it on clothes, another on an evening out, and a third might save it towards buying stereo equipment. How does Statistics Canada choose which items, out of all those available, should go into the market basket?

Every four years Statistics Canada conducts a national Family Expenditure Survey, (FAMEX). In this survey a large scientifically selected sample of households supplies details of what items have been bought and how much has been spent on them in the last year. Taking into account, then, their importance in the budget and how varied are their price movements, Statistics Canada selected for the market basket some 400 goods and services actually bought by the average Canadian urban family. The items range from bread to house repairs and postage to movies. Of course, you would not expect the basket to reflect precisely your own family's monthly expenditures. For example, few families both own a house, and rent one, but the market basket includes costs for both because of their national importance. The contents of the basket are grouped under seven headings, in the proportions shown in the most recent FAMEX survey. In the 1978 FAMEX survey these proportions were: Food, 21.1%; Housing, 35.4%, Clothing, 9.6% Transportation, 16.2%; Health and Personal Care; 3.7%; Recreation, Reading & Education, 8.6%; Tobacco & Alcohol, 5.4%.

In fact the CPI represents the spending of all families and individuals living in private households in the more than 60 urban centres with populations of over 30,000 people. This group represents over 70% of the consumer expenditure of the country. Separate studies have shown that the CPI is relevant to special groups also. For instance, between 1978 and 1982 Statistics Canada published for analytical purposes a low-income CPI. As the transparency shows, however, there was no significant difference between this and the standard CPI.

*** (See Teacher Note B3)**

(B4) Ask students which trends may influence the contents of future market baskets and their importance in a budget. Some subjects for discussion might be: the growing popularity of fuel efficient cars, increasing number of meals eaten in restaurants, high school students with part-time jobs, greater time being spent on health and fitness, etc.

(B5) Please see Worksheets immediately following Section B.

Statistics Canada has been measuring price changes since the early 1900's. Clearly, the market basket appropriate for horse and buggy days would not be appropriate in times of automobiles, frozen food and home computers. Because the national FAMEX study is conducted every four years, Statistics Canada is able to update the contents of the market basket every four years. In April, 1982, for example, when the basket was updated to reflect the findings of the 1978 FAMEX study, day care services, wall units and 35 mm cameras were added for the first time. The basket will be updated next using the results of the 1982 FAMEX survey.

*** (See Teacher Note B4)**

The CPI can only measure prices paid for a specific quantity and quality of goods or services. In the case of income tax it is impossible to quantify exactly what is received in return for each payment. In the case of medical care, the price paid by the consumer may represent only a part of the actual cost of the service. Expenses like these, therefore, though common to most Canadian families, are not included in the CPI market basket.

*** (See Teacher Note B5)**

## Answers

**B. The CPI – What Does It Measure?**

1) Gasoline will cost 45 cents a litre.
2) We cannot tell which is cheaper. The index tells us only the percentage increase in the cost of each item since the base year.
3) The price index for a movie ticket is 137.5.
4) We cannot calculate the price index because we do not know the price of the book in the base year.
5) Prices have risen by 10.8%. Mr. X's salary has risen by 12%. His salary has more than kept up with inflation.
6) The 1978 market basket was introduced in April, 1982.
7) It represents the spending patterns of 1978.
8) The basket is updated every four years.
9) Some items not included are: income tax, personal savings, medical expenses.
10) This is possible because the expenditure patterns of the CPI may not correspond to your own.
11) The CPI refers to all Canadian families in urban centres of more than 30,000 people.
12) People in rural centres are not directly covered by the CPI.
13) The time base year is the year to which the value 100 is assigned.
14) The time base year at present is 1981.
15) The time base year is changed approximately every 10 years.

## Questions

### B. The CPI – What Does It Measure?

1) If the price of gasoline was 30 cents a litre in 1981, (base year), and the gasoline index stands at 150 in 1983, what is the price of a litre of gasoline in 1983?

2) The index for hamburger is 110 and the index for sausage is 125. Can we tell which would cost less to buy?

3) If a ticket to the movies cost $2.00 in 1981 (base year), and $2.75 today, what would be the price index now for this item?

4) The price of a book is $4.00 today and was $3.60 in 1982. Can you calculate the price index today?
(The base year is 1981).

5) In 1981 (base year) Mr. X earned $25,000 a year. In 1982 he earned $28,000. If the CPI for 1982 is 110.8, has his income kept up with inflation? (By what percentage has the CPI risen? By what percentage has Mr. X's salary risen?)

6) In what year was the present market basket introduced?

7) It represents the spending patterns of what year?

8) How often is the market basket updated?

9) What common family expenditures are not included in the calculation of the CPI? Why not?

10) Is it possible for the CPI to rise by 3% in a year, while your personal expenditure decreases by 1%? Explain your answer.

11) What Canadian families are covered by the CPI?

12) What Canadian families are not covered by the CPI?

13) What do we mean by "the time base year" for the CPI?

14) What is the time base year at present?

15) How often does the time base year change?



## C. The CPI – How Is It Calculated?

### Collecting the Prices

(C1) The prices of some items, such as meat and vegetables seem to change almost every time we shop; the prices of others, such as newspapers and haircuts, remain constant longer. Students can think of reasons for this.

Statistics Canada plans the collection of prices according to the frequency of price change in the commodity. A transparency illustrates this.

Price collection is a massive undertaking which starts in the latter half of each month and goes until the middle of the next. Officials of Statistics Canada obtain prices from among others, grocery stores, department stores, hairdressers and garages. They survey electricity and gas authorities, telephone companies and airlines. The prices for food change so rapidly that they need to be collected twice every month, while prices for some items, such as automobile insurance, need only be collected twice every year. Of course, if there is any reason to suspect unusual changes in the cost of any items, arrangements are made to collect those prices more frequently.

*** (See Teacher Note C1)**

In all, more than 100,000 individual prices are gathered monthly. These are the actual prices that would be paid by a consumer on the survey day and they include any usual sales tax. If an item is offered at a discount or sale price on survey day, this is the price collected, provided there are sufficient quantities to make the item generally available.

(C2) Ask students what changes of quality they have noticed in certain items. They will probably mention improvements in e.g. tape recorders and home computers. Is it fair to compare today's prices with those of the base year if the quality of items has improved or deteriorated so much that one can hardly be said to be purchasing the same item?

From your own experience of comparison shopping, you know that it would be meaningless to compare the price of two hamburgers if one included more meat or a slice of cheese. You know too that to say the price of a certain brand of shirt is the same today as it was several months ago means little if the material or the workmanship is different today. Statistics Canada takes great care, therefore, to ensure that the quantity and quality of each item priced remains as far as possible the same from month to month. When extra refinements are added to an article, such as better quality material in a suit or automatic defrosting in a refrigerator, Statistics Canada tries as far as possible to measure the price change exclusive of quality change.

*** (See Teacher Note C2)**

### Calculating Individual Price Indexes

As the first step in the calculation of the All-Items CPI Statistics Canada assigns an individual price index to each item in the market basket. This month's price for the item is expressed as a percentage of the base month's price for exactly the same item. Imagine that a chocolate bar today costs 45 cents. In the base year, (1981), imagine that the same chocolate bar cost 30 cents. If we express this month's price as a percentage of the 1981 price, we see that:

$$\frac{45}{30} \times 100 = 150$$

The price of the chocolate bar has risen by 50%. Therefore, the price index for the chocolate bar this month is 150. Be sure to note that the indexes show only price movements, not prices. If the index for milk is 110 and that for butter is 105, this does not mean that milk is more expensive than butter. It means that the price of milk has increased twice as rapidly as the price of butter since the base period.

One price index of great concern to most Canadians in recent years has been energy. In December, 1982, using the base year 1971 instead of the present 1981 base, the index for energy stood at 430.1! Statistics

Canada publishes an index for energy as a special aggregate comprising domestic gas and electricity, gasoline, fuel oil and other types of fuel such as propane, wood, coal, etc.

## "Weighting" the Items

In measuring the percentage change in the cost of the total basket, it has to be remembered that not all price changes will affect a family's budget equally. Consider, for instance, the different effects on a family's spending of a 100% increase in the cost of pepper and a 100% increase in the cost of accommodation. The increase in the price of pepper, bought so rarely and in such small quantities by most families, might not be noticed. The increase in rent or mortgage payments might well result in drastic changes in lifestyle. The impact of the increase depends on what proportion of the family's income is devoted to the specific item.

Once again Statistics Canada turns to the results of the FAMEX survey to find out what percentage of the average Canadian budget is spent on each item in the market basket in the survey year. This percentage is known as the "weight" of the item. In the CPI items are grouped into seven "major expenditure components". The table below shows the weights for these components according to the FAMEX survey of 1978, on which the CPI has been based since April, 1982. Also shown are the weights according to the 1974 survey.

| | 1978 | 1974 |
|---|---|---|
| Food | 21.1 | 21.5 |
| Housing | 35.4 | 34.1 |
| Clothing | 9.6 | 10.1 |
| Transportation | 16.2 | 15.8 |
| Health and Personal care | 3.7 | 4.0 |
| Recreation, Reading and Education | 8.6 | 8.3 |
| Tobacco and Alcohol | 5.4 | 6.2 |
| | 100 | 100 |

These weights remain constant for four years until they are updated in keeping with the findings of the most recent national FAMEX study.

*** (See Teacher Notes C3 and C4)**

(C3) A transparency shows a pie chart illustrating the relative importance of the main expenditure components of the average Canadian budget, as supplied by the FAMEX survey of 1978.

Students might poll their own families to determine the proportion of expenditure spent on each expenditure component. How do their findings compare with those of FAMEX?

(C4) The assigned weights will not be likely to remain constant. Students can suggest how changes in prices, technology, fashion, etc. can affect spending patterns. What might happen if a family spends a third of its income on accommodation and the cost of this goes up by 100%? How might spending in the other categories be affected — alcohol and tobacco and transportation?

## Calculating the All-Items CPI

*** (See Teacher Note C5)**

The individual price indexes and the weights for each item are put together to calculate the All-Items CPI. As an example the transparency shows the price indexes and weights for the seven major components.

1) Multiply the price index for each major component by its weight.
2) Add the amounts obtained in (1).
3) Divide the result of (2) by 100.

The result is the weighted average of the major components. Although this procedure cannot be used to reconstruct the All-Items CPI or any of its aggregates, it does provide a rough approximation to the official results.

*** (See Teacher Note C6)**

(C5) A transparency shows the steps in calculating the weighted average:
Multiply each item in B by the corresponding weight in C, to give D.

Add the figures in D.

Divide this total by 100

The result is the weighted average of the major components.

(C6) Please see Worksheets immediately following Section C.

## Questions

### C. The CPI – How Is It Calculated?

1) When you started high school two years ago, you received an allowance of $48.00 every four weeks. This covered your transportation to and from school, weekday lunches, (consisting of one carton of milk, a sandwich and an apple), and recreation. By sticking to your budget you found that you could afford to attend a movie once every two weeks and to buy one record each month.

   Over time, however, prices have risen. An apple now cost 25 cents instead of the 20 cents it cost two years ago. The price of a sandwich is now 65 cents rather than 50 cents and milk is 40 cents a carton rather than 30 cents. Bus fares have risen to 45 cents from 40 cents. Movie admission has gone up to $3.00 from $2.75, while the price of a record has risen to $7.25 from $6.50.

   Clearly an allowance of $48.00 is no longer adequate to cover your expenses. Would this problem be solved if you gave up going to the movies or buying records? Of course, you could always try doing without lunch, or walking to school. If you want to maintain your standard of living, however, you might convince your parents that you need a bigger allowance.

   (i) Make a table listing all the items in your budget and their old and new prices.

   (ii) Taking your first year at high school as the base year, calculate this year's price index for each item.

   (iii) Which item's price has increased by the biggest percentage?

   (iv) How much did you spend in a four week period (a) two years ago? (b) this year?

   (v) Which item price change has had the greatest effect on your budget?

   (vi) Why is the answer to (iii) – not the same as your answer to (v)?

   (vii) Make a list of the items in your budget and show, as a percentage of your total expenditure, the relative importance of each item in your original budget. (The weights should add up to 100).

   (viii) Using your answers to (ii) and (vii) calculate your Personal Consumer Price Index for this year for each item.

      1) Item Price Index X Item Weight

      2) Add all resulting products

      3) Divide by 100 – See Transparency

   (ix) What allowance must your parents give you if you are to maintain your standard of living of two years ago? (Use the answer to iv(b) to check this)

   (x) What is the purchasing power of your dollar in base year terms? (base year = 2 years ago)

   (xi) For every $6 you spent two years ago, how much would you have to spend today, to buy the same items?

2) What are the seven major expenditure components of the CPI?

3) What do we mean by the "weight" of a component? Which major component of the CPI has the most weight? Which has the least weight?

4) An anthropologist decides to construct a CPI for a remote community of Yukon gold prospectors. In January, 1981 he finds the prospectors spent **on average**:

(a) 100 ounces of gold for flour, at 4 ounces a sack
(b) 20 ounces of gold for dogs which cost 100 ounces on average
(c) 40 ounces of gold for whisky, at 5 ounces a pint.

In January, 1982 the anthropologist finds that flour costs 6 ounces of gold, dogs sell for only 80 ounces on average, and whisky costs 10 ounces a pint.
(January 1981 = 100)

What is the CPI for the prospectors in January, 1982?

## Answers

### C. The CPI – How is it Calculated?

1) (i)

| | Old Price | New Price |
|---|---|---|
| Apples | $0.20 | $0.25 |
| Sandwiches | $0.50 | $0.65 |
| Milk | $0.30 | $0.40 |
| Bus fares | $0.40 | $0.45 |
| Movies | $2.75 | $3.00 |
| Records | $6.50 | $7.25 |

(ii) Apples, 125; sandwiches, 130; milk, 133.3; bus fares, 112.5; movies, 109.1; records, 111.5.

(iii) Milk has increased by the biggest percentage since the base year, (33.3 per cent).

(iv) In a four week period you spent (i) two years ago, $48.00; this year, $57.25.

(v) The price change in sandwiches has affected your budget most. You spend an extra $3.00 per month.

(vi) This is because the weight for sandwiches is 20.8. The weight for milk is only 12.5.

(vii) The weights are: apples, 8.3; sandwiches, 20.8; milk, 12.5; bus fares, 33.3; movies, 11.5; records 13.5 (= 99.9).

(viii) Your personal CPI is 119.3

(ix) Your parents should increase your allowance to $57.25.

(x) Your dollar today is worth 83.82 cents, in base year terms.

(xi) You would have to spend $7.16 today for every $6.00 you spent two years ago.

2) The seven major components of the CPI are: food; housing; clothing; transportation; health and personal care; recreation, reading and education; tobacco and alcohol.

3) The "weight" of a component is the percentage of the total expenditure devoted to it. Housing is the component with the most weight in the CPI (35.4%). Health and personal care is the component with the least weight (3.7%).

4) The CPI for the prospectors is 153.75.

## D. The CPI Bulletin — What It Can Tell You

(D1) A transparency shows Table 1 from the CPI Bulletin. This gives the CPI for the current month, the previous month, the current month one year ago, as well as the purchasing power of the current month's dollar, and the All-Items index converted to a 1971 base, etc.

On publication day, towards the middle of each month, Statistics Canada publishes 4,000 copies of the CPI Bulletin for newspapers, television and radio stations, government officials, union and business leaders, and members of the public.

*** (See Teacher Note D1)**

As you see from the transparency, one page of the Bulletin gives the national All-Items CPI, for the current month, the previous month and the current month one year ago. There are indexes also for the major components, food, housing, clothing, transportation, health and personal care, recreation, reading and education, and tobacco and alcohol.

The CPI receives enormous attention from its users across the country and Statistics Canada offices answer thousands of telephone requests for more detailed information than the Bulletin provides.

Reading newspaper articles on the CPI can, however, be confusing. One may stress the figures for one city, and another the figures for the country as a whole. One may refer to point changes in the CPI and another to percentage changes. As well, some writers describe the CPI, somewhat misleadingly, as a Cost of Living Index. The next few paragraphs should explain away the confusion.

### The City Indexes

*** (See Teacher Note D2)**

(D2) Table B in the Worksheets immediately following Section D shows the CPI for 15 major Canadian cities in 1978, 1981, and 1982.

One important function of the CPI Bulletin is to provide information on changing prices in 15 major Canadian cities, at least one in each province. They are: St. John's, Charlottetown (with Summerside), Halifax, Saint John, Quebec, Montreal, Ottawa, Toronto, Thunder Bay, Winnipeg, Regina, Saskatoon, Edmonton, Calgary and Vancouver. (The Bulletin also gives some details of price changes in Yellowknife and Whitehorse. At present these cities are not part of the national index but they will be included when the CPI is next updated.)

Commentaries and tables show the All-Items index for each city and the indexes for the major components. Also given are the percentage changes in each index from the previous month and from the current month one year ago.

This information cannot, of course, be used to compare the relative costs of living in any of the cities. The indexes for each can tell us only the percentages by which prices have risen or fallen in that city. If the CPI for Quebec is 150 and that for Edmonton is 175, this does not mean that it costs more to live in Edmonton. It does mean that, since the base year, prices have risen more in that city than in Quebec.

Some comparisons of actual prices for goods and services in the selected cities can be seen in another Statistics Canada publication, the quarterly *"Consumer Prices and Prices Indexes"*, (Catalogue No. 62-010).

## Percentage Change and Point Change

If the base year is 1981 and the CPI for March, 1983 is 115.8 we can say either:

The index has increased by 15.8 points
(115.8 − 100) = 15.8 points
or
The index has increased by 15.8%; $\frac{(115.8 - 100)}{100} \times 100 = 15.8\%$

The difference between the CPI's is the same whether it is expressed as a point change or a percentage change. This is only true, however, if we are comparing the index for a given time with the index for the base year. We often wish to measure price change without reference to the base period of the index. In this case we must be careful not to confuse the point change with the percentage change over the same period.

e.g. November, 1975 CPI = 60.8

March, 1983 CPI = 115.8

The point change between the two CPI's is

(115.8 − 60.8) = **55** points.

The percentage change between the two years is

$\frac{(115.8 - 60.8)}{60.8} \times 100 = \mathbf{90.46}\%$

(D3) Students can use the information on the poster showing price indexes for specific items in various years, to calculate the percentage change and the point change between indexes.

*** (See Teacher Note D3)**

## Not a Cost-of-Living Index

The CPI has many uses as long as we accept it for what it is – an indicator of changes, over time, in retail prices. We sometimes hear it referred to, however, as a cost of living index. Strictly speaking, this is a misnomer and no country in the world has been able to produce such an index.

A cost of living index can be thought of as the minimum amount of money required in different periods of time in order for the consumer to maintain a given standard of living or to provide a given level of satisfaction. As it is impossible to measure the satisfaction that consumers derive from the purchase of various combinations of goods and services, it is impossible to derive a true cost of living index.

Given this definition of a cost of living index, there are some important reasons why the CPI is **not** a cost of living index. A cost of living index would include those expenditures such as income tax payments and medical premiums which are presently excluded from the CPI. These are clearly important elements in the spending habits of the average Canadian family and an index which does not take them into account cannot be said to measure the cost-of-living.

More importantly, a cost of living index would immediately reflect the various substitutions that consumers tend to make in order to maintain their standard of living in the face of changing prices. For example, if the price of beef goes up considerably, a family may decide to reduce its purchases of beef, increase its purchases of poultry and feel that by making these substitutions, its standard of living has been unaffected. The CPI, however, does not reflect the impact of these substitutions on a day-to-day basis as the contents of the basket remain constant over a four year period.

Statistics Canada produces several other measures of price changes. Important examples of these are the quarterly Gross National Expenditure Implicit Price Index with its various sub-component implicit price indexes and

the monthly Index of Industry Selling Prices (ISPI). The Gross National Product Implicit Price Index is a more general measure of inflation as it includes all sectors of the economy including government, construction and exports. Unlike the CPI, current expenditure patterns are used in the construction of this index. The Industry Selling Price Index is a measure of Canadian manufacturers' selling prices. The CPI should be used in conjunction with these other indexes in order to obtain a better picture of price changes in the economy.

(D4) Please see Worksheets immediately following Section D.

*** (See Teacher Note D4)**

## Answers

### D. The CPI Bulletin — What It Can Tell You

| | | | |
|---|---|---|---|
| 1) | T.V. dinners | – Prepared main dishes | 116.8 |
| | Rolls | – Bakery products | 107.8 |
| | Chicken | – Poultry | 100.7 |
| | Milk | – Fresh fluid milk | 112.6 |
| | Peaches | – Processed fruit | 112.2 |
| | Potatoes | – Fresh vegetables | 91.6 |
| | Broccoli | – Processed vegetables | 123.2 |

2) The index for fresh fruit has decreased most since March, 1982, (−11%).

3) The index for pork has increased most rapidly since March, 1982, (20.6%).

4) The index for fresh vegetables has increased most rapidly since February, 1983, (8.7%).

5) The index for poultry shows the least percentage **increase** since the base year (p.i = 100.7).

6) The index for processed vegetables shows the most percentage increase since the base year, (p.i = 123.2).

7) i) Quebec's CPI has risen more than that of any other city in the Table since the base year.

ii) Winnipeg's CPI has risen less than that of any other city in the Table since the base year.

iii) Each city index shows only the percentage by which prices have risen **in that city** since the base year. We cannot use the Table to make comparisons between cities.

8) The CPI cannot be regarded as a cost of living Index because:

i) it does not reflect the immediate substitutions a family might make for some market basket items while keeping the same level of satisfaction.

ii) it does not include some important family expenditures such as income tax and medical care premiums.

9) Statistics Canada also produces the Gross National Product Implicit Price Index and the Index of Industry Selling Prices, (ISPI).

**Table A**

**Consumer Price Indexes for Canada, Major Components, Selected Sub-groups and Special Aggregates (Not Seasonally Adjusted), 1981 = 100**

| Major components, selected sub-groups and special aggregates | | | | Percentage change – March 1983 from | |
|---|---|---|---|---|---|
| | March 1983 | February 1983 | March 1982 | February 1983 | March 1982 |
| **All-Items** | 115.8 | 114.6 | 108.0 | 1.0 | 7.2 |
| Major Components and selected sub-groups: | | | | | |
| Food | 108.9 | 109.2 | 104.6 | −0.3 | 4.1 |
| Food purchased from stores | 107.0 | 107.4 | 104.0 | −0.4 | 2.9 |
| Meat, Poultry and Fish | 104.5 | 106.1 | 100.0 | −1.5 | 4.5 |
| Meat | 104.6 | 106.2 | 98.3 | −1.5 | 6.4 |
| Beef | 95.2 | 97.2 | 95.4 | −2.1 | − 0.2 |
| Pork | 122.4 | 125.4 | 101.5 | −2.4 | 20.6 |
| Other Meat | 107.7 | 106.7 | 101.7 | 0.9 | 5.9 |
| Poultry | 100.7 | 104.0 | 106.9 | −3.2 | − 5.8 |
| Fish | 113.8 | 113.2 | 107.0 | 0.5 | 6.4 |
| Dairy products and eggs | 113.6 | 113.6 | 106.6 | 0.0 | 6.6 |
| Dairy products | 115.6 | 115.3 | 107.6 | 0.3 | 7.4 |
| Fresh fluid milk | 112.6 | 113.0 | 106.8 | −0.4 | 5.4 |
| Eggs | 97.4 | 99.0 | 98.7 | −1.6 | − 1.3 |
| Cereal and bakery products | 108.9 | 108.9 | 104.6 | 0.0 | 4.1 |
| Cereal products | 111.9 | 111.2 | 107.4 | 0.6 | 4.2 |
| Bakery products | 107.8 | 108.1 | 103.6 | −0.3 | 4.1 |
| Bread | 107.3 | 108.5 | 103.8 | −1.1 | 3.4 |
| Fruit and vegetables | 103.8 | 102.0 | 109.0 | 1.8 | − 4.8 |
| Fresh fruit | 103.9 | 104.9 | 116.7 | −1.0 | −11.0 |
| Processed fruit | 112.2 | 114.0 | 109.9 | −1.6 | 2.1 |
| Fresh vegetables | 91.6 | 84.3 | 100.4 | 8.7 | − 8.8 |
| Processed vegetables | 123.2 | 124.6 | 113.1 | −1.1 | 8.9 |
| Sugar and confections | 88.9 | 89.7 | 94.2 | −0.9 | − 5.6 |
| Coffee and Tea | 98.0 | 99.2 | 98.8 | −1.2 | − 0.8 |
| Fats and oils | 106.7 | 107.3 | 102.9 | −0.6 | 3.7 |
| Prepared and partially prepared main dishes | 116.8 | 117.4 | 108.0 | −0.5 | 8.1 |
| Other food purchased from stores | 112.3 | 113.3 | 106.5 | −0.9 | 5.4 |
| Food purchased from restaurants | 115.0 | 114.9 | 106.7 | 0.1 | 7.8 |

**Table B.**

CPI for Fifteen Major Canadian Cities

| | 1978 | 1981 | 1982 |
|---|---|---|---|
| St. John's | 71.9 | 100 | 110.0 |
| Charlottetown/Summerside | 73.5 | 100 | 109.5 |
| Halifax | 74.2 | 100 | 109.6 |
| Saint John | 73.5 | 100 | 109.4 |
| Quebec | 73.7 | 100 | 112.2 |
| Montreal | 73.9 | 100 | 111.6 |
| Ottawa | 74.9 | 100 | 109.9 |
| Toronto | 73.9 | 100 | 111.3 |
| Thunder Bay | 74.9 | 100 | 110.4 |
| Winnipeg | 75.0 | 100 | 108.8 |
| Regina | 75.0 | 100 | 109.0 |
| Saskatoon | 74.4 | 100 | 109.0 |
| Edmonton | 74.1 | 100 | 110.8 |
| Calgary | 73.6 | 100 | 112.0 |
| Vancouver | 74.3 | 100 | 110.5 |

## Questions

### D. The CPI Bulletin — What It Can Tell You

Questions based on Table A (Table 3 of March, 1983, CPI Bulletin.)

1) Imagine that you visit a supermarket and buy: 2 TV dinners, 1 dozen rolls, 1 kg. chicken, 1 litre of milk, 2 cans of peaches, 2 kg. potatoes, 1 packet of frozen broccoli. Under which heading on the table would you put each item? What was the price index for each at March, 1983?
2) According to the table, in March, 1983 which index has decreased most since March, 1982?
3) According to the table, in March, 1983 which index has increased most rapidly since March, 1982?
4) Which index has increased most since February, 1983? How would you explain this?
5) In March, 1983 which index shows the least percentage **increase** since the base year?
6) In March, 1983 which index shows the greatest percentage increase since the base year?

Question based on Table B.

7) (i) According to the table, which city's CPI has increased the most since the base year, (1981)?

   (ii) Which city's CPI has increased the least since the base year, (1981)?

   (iii) Can you tell from this table which is the most expensive city to live in?
8) Give two reasons why the CPI cannot be described as a cost of living Index.
9) Name two other price indexes produced by Statistics Canada.

Canada's Consumer Price Index

## E. The CPI — How to Use It

(E1) A transparency shows the worth of the 1981 (base year) dollar in various years.

Students should calculate the worth of the current month's dollar, in base year terms, according to the most recent CPI Bulletin.

Please note that Table C in Worksheets immediately following Section E gives the All-Items indexes and indexes for some components for the years 1968-82 (1981=100).

We saw in Section A that governments and unions use the CPI. It can also help us to understand our personal finances.

Using the base year 1981, the All-Items CPI for Canada in March, 1983 was 115.8. This meant that for every dollar you spent in 1981, you had to spend almost $1.16 to buy the same items in March, 1983.

Another way of expressing this would be to say that the dollar of March, 1983, in base year terms, was worth only 86.3 cents.

$$\frac{100}{\text{CPI}} \times 100 = \text{Value of dollar in Base Year Terms}$$

$$\frac{100}{115.8} \times 100 = 86.3$$

*** (See Teacher Note E1)**

Thus we can use the CPI to calculate the worth of a person's salary today in terms of the base year dollar. If we compare this amount with his base year salary we can see whether his income has kept pace with inflation.

$$\frac{\text{Today's Income}}{\text{CPI}} \times 100 = \text{Income expressed in Base Year terms}$$

In the example below, although income has increased, it has not kept up with inflation.

| Year | Income | CPI | Real Income |
|---|---|---|---|
| 1981 | $25,000 | 100.0 | $25,000.00 |
| 1982 | $26,000 | 110.6 | $23,960.21 |

(**N.B.** It may be misleading to perform this calculation on before tax income, as income tax is not included in the CPI.)

Again, the owner of a food store may wish to know if his sales have kept up with inflation. Assuming that the sales volume has remained constant, he can find out by calculating the total sales revenue in terms of base year dollars and comparing them with his sales in the base year. Because the All-Items CPI includes many items not found in food stores, the owner must use a more appropriate index, perhaps the "Food Purchased from Stores" index, (FPS), in his calculation.

| Year | Sales | FPS | Sales in Base Year Terms |
|---|---|---|---|
| 1981 (base year) | $1,200,000 | 100 | $1,200,000 |
| 1982 | $1,250,000 | 106.4 | $1,174,812 |

$$\frac{\$1,250,000}{106.4} \times 100 = \$1,174,812$$

His sales have not kept up with inflation.

Examples like these show how changes in the CPI can greatly affect the finances of the individual, as well as those of the country as a whole. Although, as we have seen, it ought not to be called a cost of living index, the CPI does provide a reliable measure of changes in retail prices. When used with the other indexes mentioned earlier, it can give a broad picture

(E2) Students could discuss how various people might use the CPI:
— a hockey player negotiating a contract
— a family contemplating a move to a different city in Canada
— a restaurant owner assessing the success of his business

(E3) Please see Worksheets immediately following Section E.

of inflation in Canada. This is why, over the years, the CPI has become so well known and accepted by experts and the general public alike.

*** (See Teacher Notes E2 and E3)**

## Answers

**E. The CPI – How to Use It**

1) No. In order to keep up with inflation Mr. Jones would have had to earn $33,240 in 1982.
2) Yes Mrs. Smith's travel allowance need only have been $1,925.45 in order to keep up with the index for transportation.
3) The food charge in 1982 should be $2,619.20.
4) The most the landlord can charge in 1982 is $1,337.01.
5) This would not be fair, because not all the landlord's costs are increasing in the same way as the energy costs.
6) The article would cost $5.83 in 1982.
7) In 1982, energy had increased more than any other index since the base year.
8) Energy prices increased most between 1980 and 1981. The point change was 23.1; the percentage change was 30.04.
9) Food prices increased most between 1973 and 1974. The point change was only 7; the percentage change, however, was 16.5%.
10) The All-Items index increased most between 1980 and 1981. The point change was 11.1; the percentage change was 12.48%.
11) The contents of your family's market basket and their weights are almost sure to have changed since 1972 because of changes in prices, family size, interests etc.
12) His sales have not kept up with inflation. In base year terms he sold $147,928.99 worth of goods in 1971.
13) Mr. A's pension of $10,000 is worth, in base year terms: 1971, $23,696.68; 1975, $17,094.02; 1982, $9,025.27.
14) In terms of the base year, 1981, he earned $26,509.57 in 1977. His (base year) income ($32,000.00), has more than kept up with inflation.
15) The dollar in 1982 was worth 90.25 cents in base year, (1981), terms.

## Essay or Debate Topics

1. "The CPI is an ineffective way of measuring inflation". Discuss.
2. The CPI is a useful statistic or a misleading statistic? Discuss both points of view.
3. "The CPI isn't a barometer of price increases, it's a trigger" – John Biddell at 1980 Couchiching Conference. Discuss.
4. "What we really need is a Cost of Living Index". Discuss.

## QUESTIONS

### E. The CPI — How to Use it
### Questions based on Table C

1) In 1981 Mr. Jones earned $30,000 a year. In 1982 he earned $31,500 a year. Had his income kept up with inflation?

2) In 1969 Mrs. Smith's firm gave her a $1,000 travel allowance. By 1979 this had been increased to $2,200. Had the allowance kept up with the rising cost of transportation?

3) The students in a co-op residence wish to tie the charge for food to the food index of the CPI. In 1976 the food charge was $1,400 a year. What ought it to be in 1982?

4) When John moved into his apartment in 1975 there was a clause in his rental agreement linking the rent to the housing index of the CPI. At that time the rent was $700 a month. Assuming no rent controls, what is the most the landlord can charge in 1982 before he is breaking the terms of the agreement?

5) Because he is spending so much on energy, a landlord wishes to link increases in the rent to the rise in the energy index of the CPI. Would this be fair?

6) If an item which cost $2.00 in 1968 changed its price in exactly the same way as the All-Items CPI, what would it cost in 1982?

7) According to the table, which index has increased most since the base year? Can you suggest why?

8) In which year did energy prices increase most?
What was the point change from the previous year?
What was the percentage change?

9) In which year did food prices increase most?
What was the point change from the previous year?
What was the percentage change?

10) In what year did the All Items CPI increase most?
What was the point change from the previous year?
What was the percentage change?

11) What did your household spend on food last month? Using the food index, calculate what the same amount of food would have cost in 1972. Why is it unlikely that your household did spend this amount in 1972?

12) Mr. Y. owns a foodstore. In 1971 his annual sales were $50,000. In 1981 they were $135,000. Have his sales kept up with inflation? Your answer will only be valid if it is assumed that the volume of sales is the same. (Be sure to select the most appropriate index from the table to calculate your answer).

13) On his retirement in 1971, Mr. A became entitled to a fixed pension of $10,000 a year. What is the purchasing power of his pension, in terms of the 1981 base year dollar, in 1971? 1975? 1982?

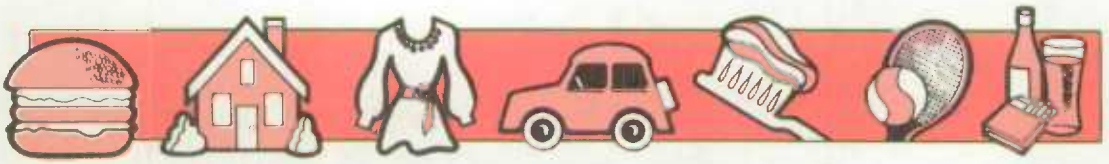
14) In 1977 Mr. B. earned $18,000 a year. In 1981 he earned $32,000 a year. Has his income gone up in real (i.e. base year) terms?

15) How much is the 1982 dollar worth, in 1981 (base year) terms?

**Table C.**

| Year | All Items | Food | Food Purchased from Stores | Housing | Transportation | Energy |
|---|---|---|---|---|---|---|
| 1968 | 38.0 | 32.0 | 31.8 | 38.3 | 37.2 | – |
| 1969 | 39.7 | 33.3 | 33.1 | 40.3 | 38.9 | – |
| 1970 | 41.0 | 34.1 | 33.6 | 42.3 | 40.4 | – |
| 1971 | 42.2 | 34.4 | 33.8 | 44.2 | 42.1 | 29.1 |
| 1972 | 44.2 | 37.0 | 36.4 | 46.2 | 43.2 | 29.9 |
| 1973 | 47.6 | 42.4 | 41.9 | 49.2 | 44.3 | 32.6 |
| 1974 | 52.8 | 49.4 | 48.5 | 53.5 | 48.7 | 37.6 |
| 1975 | 58.5 | 55.8 | 54.6 | 58.9 | 54.4 | 42.7 |
| 1976 | 62.9 | 57.3 | 55.4 | 65.4 | 60.3 | 49.2 |
| 1977 | 67.9 | 62.0 | 60.3 | 71.5 | 64.6 | 55.2 |
| 1978 | 73.9 | 71.6 | 70.8 | 76.9 | 68.3 | 60.4 |
| 1979 | 80.7 | 81.0 | 80.4 | 82.3 | 74.9 | 66.3 |
| 1980 | 88.9 | 89.8 | 89.4 | 89.0 | 84.5 | 76.9 |
| 1981 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1982 | 110.8 | 107.2 | 106.4 | 112.5 | 114.1 | 119.8 |

* Base Year is 1981.





## Bibliography


Available from Publication Sales and Services
Statistics Canada
Ottawa, K1A OT6 Tel.: (613) 593-7276

1) **Consumer Prices and Price Indexes** – Quarterly, Catalogue No. 62-010
$ 6.35 a copy,
$25.40 a year

2) **The Consumer Price Index** – Monthly, – Catalogue No. 62-001
$ 2.65 a copy, $ 26.50 a year.

3) **The Consumer Price Index Reference Paper** – Occasional - Updating based on 1978 expenditures – Catalogue no. 62-553,
$ 8.00

Available from your Statistics Canada Regional Office (see list on page 14)

1) **The ABC of the CPI** – A slide-tape presentation
May be borrowed from your local Statistics Canada Office

2) **Updating of the Consumer Price Index** – 1981
Free

3) **Your Guide to the Consumer Price Index**
Free

Available from the Canadian Foundation for Economic Education
252 Bloor Street West
Suite 5-130
Toronto, Ontario M5S 1V5

1) **Economic Statistics** – A Workbook CFEE 1981
Members: $ 5.60
Non-Members: $ 7.00

2) **The Business Page** by Wayne Cheveldayoff, Ottawa – Deneau & Greenberg – 1981,$ 6.50 + $ 1 postage

Available from: Media Algonquin
or Department of Management
Algonquin College
Woodroffe Avenue
Ottawa, Ontario

1) **Descriptive Statistics and Business** – 1982
$ 14.85

Available from: Supply and Services Canada, Ottawa
Canadian Government Publishing Centre
Ottawa – K1A 0S9

1) **Towards a Better Understanding of the Consumer Price Index** – M. McCracken, 1980 $ 3.50
Catalogue no. EC 22-88-1980-E

## More information on the CPI is available from:

Prices Division,
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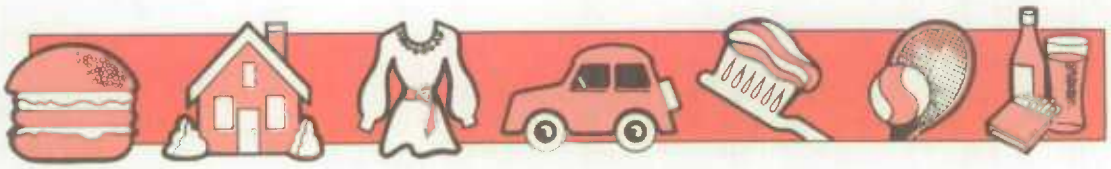



## The Student Price Index

Students enjoy working together to construct a Student Price Index, SPI. This shows the change, over time, in the prices of those goods and services teenagers most often buy. Examples might be hamburgers, records, movie tickets and video games.

Used as part of a course in economics, business, or consumer studies, the exercise reinforces the students' understanding of how the CPI is built and used. It prompts such questions as: Why do prices for some items change from month to month, while prices for others remain constant? Is my income keeping up with inflation? How can I use the Student Price Index to make changes in my income or my spending? How does the SPI compare with the CPI for the same period?

The project can also be used in statistics or business mathematics courses as a practical way to introduce statistical concepts and methodologies. In constructing the SPI students must be aware of the importance of data quality and reliability, and understand indexing and time - series concepts. Distributions, regressions, correlations, chi square can also be introduced, at the discretion of the teacher.

This activity is also worthwhile because, at the same time as generating enthusiastic participation by the students, it illustrates the value of class co-operation, organization, and careful record keeping.

It is suggested that the project continue over at least one term and take up perhaps 6-8 classroom periods.

### (1) Annual Student Expenditure Survey Sheet

Every student should complete a copy of this individually. (As it will be difficult for students to recall all purchases for the year, they should recall them for one month and multiply by 12 to obtain the annual expenditure, except for school purchases which they should multiply by 10, as the school year has only 10 months.)

Students should add, under "others", any items they think ought to have been included.

This survey makes students aware of the range of goods and services bought by teenagers. They will enjoy comparing their own spending patterns with those of the rest of the class, and may well be surprised by how much is spent, in total, on some items. Students will see clearly that price changes significantly affect the purchasing power of their own dollar. Students will realize too, perhaps for the first time, that teenage spending plays a substantial part in the economy of the country.

By combining the information collected on the individual survey sheets, the class can select a market basket of goods and services that is truly representative of the purchases of the group.

### (2) Basket Selection Table

The class can complete this after a discussion in which students share the information obtained from the Student Expenditure Survey Sheet.

At this point it should be stressed that the usefulness of the project depends on strict accuracy in the collection and recording of information. Guesswork and carelessness would result in meaningless statistics.

It should be clear from the completed Basket Selection Table that some items are more "important" to the students' budgets than others. The importance is shown in terms of the percentage of students who buy certain items and the percentage of the class total expenditure devoted to them.

The class should decide on the 20 items that most represent the purchases of the whole group. In making the selection the class should try to include only those items that continue to be popular from year to year and season to season and for which prices can be easily obtained.

**These 20 items should now be entered in Column A on the SPI Calculation sheet.**

## (3) Weights Table

Students are now able to complete:

Column A: list of 20 selected items
Column B: amount spent by all students on each item

They can then go on to calculate:

(1) the total expenditure of the class for all 20 items
(2) the percentage of this total accounted for by each item (column C)

This percentage gives the "weight" of each item, its relative importance in the market basket expressed as a percentage (column D)

*** These weights should now be entered in Column B on the SPI Calculation Sheet**

## (4) Item Description

Students should divide the responsibility for the 20 items so that each item is covered by one or more students. To ensure that the pricing will always refer to the same quantity and quality, the student should write a description of the item.

**e.g.** Hamburger: 200 gms meat; bun toasted; lettuce; tomato; onion; condiments, (ketchup, mustard, pickles, relish)

The description should meet the approval of the class. At this point students should be reminded of the importance of constant quality and quantity of the items priced for the CPI. (See Section C)

## (5) Item Price Collection Sheet

**Columns A, B, C, & D**

- Each student is now responsible for completing these each month, for his/her item.
- Price collection should take place at the same time each month, and at the same outlets. The outlets chosen should be those found to be most popular according to the completed Student Expenditure Survey Sheets.
- Where possible, as shown in the sheet, students should obtain several prices to reach a single average price for each month

$$\frac{A+B+C}{3} = D, \text{ average price}$$

- Prices should include any sales tax. "Sale" and "Special" prices should be the ones collected if there are sufficient quantities of the item to make it generally available.
- The collector should be sure that the price collected refers to the strict quantity and quality of the item description.

**Columns E & F**

These can be completed after the teacher has explained the concept of indexing. (See Section B)

(1) Student assigns the index value of 100 to the cost of the item in month 1 (base month)

(2) Student calculates the average price each month as a percentage of the average base month price. $\frac{\text{Column D for current month}}{\text{Column D for month 1 (base month)}} \times \frac{100}{1}$

The result is entered in column E.

(3) This percentage gives the index for each month (column F)

*** The price index for each item should be entered in Column C of the SPI Calculation Sheet,**

## (6) SPI Calculation Sheet

Using the figures already entered on the sheet students will now:

(1) Multiply each item price index (column C) by its corresponding weight (column B)

(2) Enter the result in column D

(3) Add the amounts in column D

(4) Divide this sum by 100

The result = Student Price Index for all items for the given month.

**(7)** After calculating the SPI for several months, students could make a chart showing base month and final month price indexes. They may wish to suggest reasons for certain price changes.

Another exercise might be plotting a graph to show the pattern of price changes as shown by the SPI over several months. This could be compared with a graph showing changes in the All-Items CPI for the same period.

## Annual Student Expenditure Survey Sheet (i)

(For items like food and other regular expenditures, estimate your expenditure over the past month and multiply this by 12 to obtain a figure for the whole year.* Try to recall all major expenditures and include in "others" those not covered in the listings)
Please include only the items **you** paid for.
Total price should include sales tax where applicable.

| Item | (1) Frequency of purchase | (2) Average price | (3)=(1)X(2) Total expenditure | Location of purchase |
|---|---|---|---|---|
| **Food at school:** | | | | |
| – Soup | | | | |
| – Sandwiches | | | | |
| – Hamburgers | | | | |
| – Milk | | | | |
| – Soft drinks | | | | |
| – Other (specify) | | | | |
| **Between – Meal food:** | | | | |
| – Ice cream | | | | |
| – Potato chips | | | | |
| – Chocolate bars | | | | |
| – Soft drinks | | | | |
| – Gum | | | | |
| – Other (specify) | | | | |
| **Restaurant Meals:** | | | | |
| – Hot dogs | | | | |
| – Hamburgers | | | | |
| – French fries | | | | |
| – Pizza | | | | |
| – Chicken | | | | |
| – Other (specify) | | | | |
| (Include here only if they constituted a meal – if not, they should be included with between-meal food) | | | | |
| **Other (specify – no more than three items)** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Food Expenditures: Column 3** | | | | |

* For the "food at school" section, monthly expenditure would be multiplied by 10, not 12, as there are only 10 months in the school year.

# Annual Student Expenditure Survey Sheet (ii)

## Recreation Expenses

| Item | (1) Frequency of purchase | (2) Average price | (3)=(1)X(2) Total expenditure | Location of purchase |
|---|---|---|---|---|
| **Movies:** | | | | |
| **Records:** | | | | |
| – Singles | | | | |
| – Albums | | | | |
| – Tapes | | | | |
| **Equipment:** | | | | |
| – Radios | | | | |
| – Tape decks | | | | |
| – Record players | | | | |
| – Stereo sets | | | | |
| **Attendance at:** | | | | |
| – Discos | | | | |
| – Dances | | | | |
| – Spectator sports: | | | | |
| – Hockey games | | | | |
| – Football games | | | | |
| – Other (specify) | | | | |
| **Participation in sports events:** | | | | |
| – Skiing | | | | |
| – Swimming | | | | |
| – Tennis | | | | |
| **Recreation Equipment:** | | | | |
| – Skis | | | | |
| – Ski boots | | | | |
| – Tennis rackets | | | | |
| – Bicycles | | | | |
| – Skates | | | | |
| – Other (specify) | | | | |
| **Other Recreation and Entertainment Expenses (specify):** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Expenditures** Column (3) | | | | |

## Basket Selection Table (i)

| Item | (1) No. of students who purchased item in year | (2) Percent-age of students who purchased item in year | (3) Student expenditure on each item in year | (4) Expenditure item as a percentage of total class expen-diture (total column 3) |
|---|---|---|---|---|
| **Food at school:** | | | | |
| – Soup | | | | |
| – Sandwiches | | | | |
| – Hamburgers | | | | |
| – Milk | | | | |
| – Soft drinks | | | | |
| – other (specify) | | | | |
| **Between – meal food:** | | | | |
| – Ice cream | | | | |
| – Potato chips | | | | |
| – Chocolate bars | | | | |
| – Soft drinks | | | | |
| – Gum | | | | |
| – Other (specify) | | | | |
| **Restaurant meals:** | | | | |
| – Hot dogs | | | | |
| – Hamburgers | | | | |
| – French fries | | | | |
| – Pizza | | | | |
| – Chicken | | | | |
| – Other (specify) | | | | |
| **Other (specify – no more than three items:** | | | | |
| | | | | |
| | | | | |
| **Movies:** | | | | |
| **Records:** | | | | |
| – Singles | | | | |
| – Albums | | | | |
| – Tapes | | | | |

## Basket Selection Table (ii)

| Item | (1) No. of students who purchased item in year | (2) Percent-age of students who purchased item in year | (3) Student expenditure on each item in year | (4) Expenditure on item as a percentage of total class expenditure (total column 3) |
|---|---|---|---|---|
| **Equipment:** | | | | |
| – Radios | | | | |
| – Tape decks | | | | |
| – Record players | | | | |
| – Stereo sets | | | | |
| **Attendance at:** | | | | |
| – Discos | | | | |
| – Dances | | | | |
| – Spectator sports: | | | | |
| – Hockey games | | | | |
| – Football games | | | | |
| – Other (specify) | | | | |
| **Participation in sports events:** | | | | |
| – Skiing | | | | |
| – Swimming | | | | |
| – Tennis | | | | |
| **Recreation Equipment:** | | | | |
| – Skis | | | | |
| – Ski boots | | | | |
| – Tennis rackets | | | | |
| – Bicycles | | | | |
| – Skates | | | | |
| – Other (specify) | | | | |
| **Other recreation:** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Expenditures** Column (3) | | | | |

## Weights Table

| (A) Item | (B) Amount spent by all students | (C) Expenditures on each item as % of total of (B) | (D) Weight |
|---|---|---|---|
| | | | |
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| | | | |
| | | | |
| Total expenditure | | | Should add to 100 |

## Item Price Collection Sheet

Item _____

| | (A) Sample price 1 | (B) Sample price 2 | (C) Sample price 3 | (D) $\frac{A+B+C}{3}$ = Average price | (E) Price as percentage of base month price | (F) Index |
|---|---|---|---|---|---|---|
| Month 1 (Base month) | | | | | 100 | 100 |
| Month 2 | | | | | | |
| Month 3 | | | | | | |
| Month 4 | | | | | | |
| Month 5 | | | | | | |
| Month 6 | | | | | | |

# Student Price Index

## Calculation Sheet

| (A) Name of item | (B) "Weight" of item | (C) Item price index | (D) Weight X price index of item (B X C) |
|---|---|---|---|
| | | | |
| | | | |
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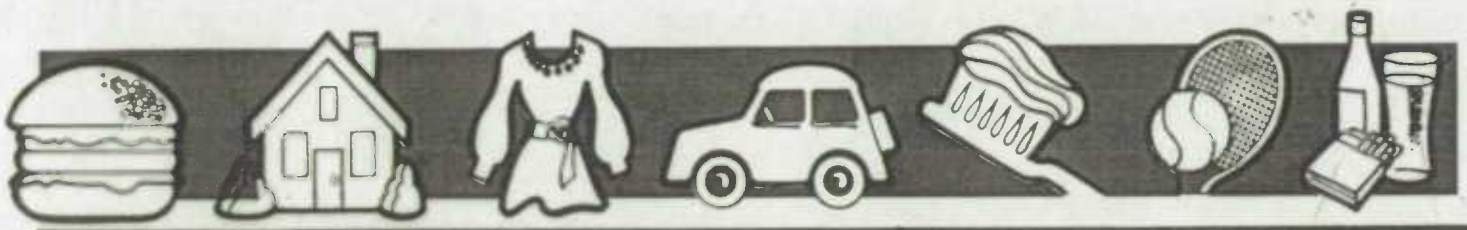
| | | | |
| | | | |
| | | column (D): Total | |

All-Items Index = Total of Column D divided by 100 (base period = 100) = _____

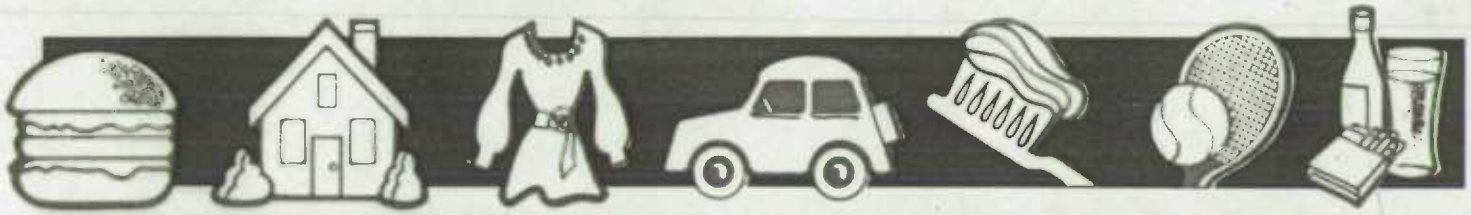


Canada's Consumer Price Index

# MAJOR COMPONENTS (Not Seasonally Adjusted). Canada, (1) 1981=100

| | Indexes | | | Percentage change March 1983 from | |
|---|---|---|---|---|---|
| | March 1983 | February 1983 | March 1982 | February 1983 | March 1982 |
| All-items | 115.8 | 114.6 | 108.0 | 1.0 | 7.2 |
| Food | 108.9 | 109.2 | 104.6 | – 0.3 | 4.1 |
| All-items excluding food | 117.8 | 116.2 | 109.0 | 1.4 | 8.1 |
| Housing | 119.0 | 117.9 | 109.7 | 0.9 | 8.5 |
| Clothing | 109.6 | 108.5 | 104.7 | 1.0 | 4.7 |
| Transportation | 119.7 | 115.9 | 111.3 | 3.3 | 7.5 |
| Health and personal care | 116.6 | 115.9 | 108.1 | 0.6 | 7.9 |
| Recreation, reading and education | 113.8 | 113.5 | 105.5 | 0.3 | 7.9 |
| Tobacco and alcohol | 124.6 | 124.1 | 109.7 | 0.4 | 13.6 |
| Purchasing power of the consumer dollar expressed in cents, compared to 1981 | 86.4 | 87.3 | 92.6 | | |
| All-items Consumer Price Index converted to 1971 = 100 | 274.3 | | | | |

(1) For aggregation of indexes see "Technical Notes (The Consumer Price Index) – Weights and Linking" at the end of this publication



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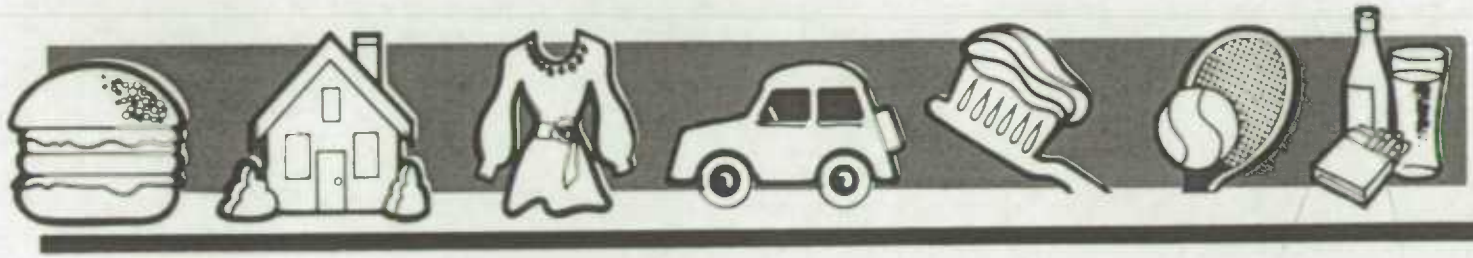
# HOW MUCH IS YOUR DOLLAR REALLY WORTH?

$$\frac{\$1.00}{\text{CPI}} \text{ (Current year) X 100} = \text{VALUE OF DOLLAR IN BASE YEAR TERMS}$$



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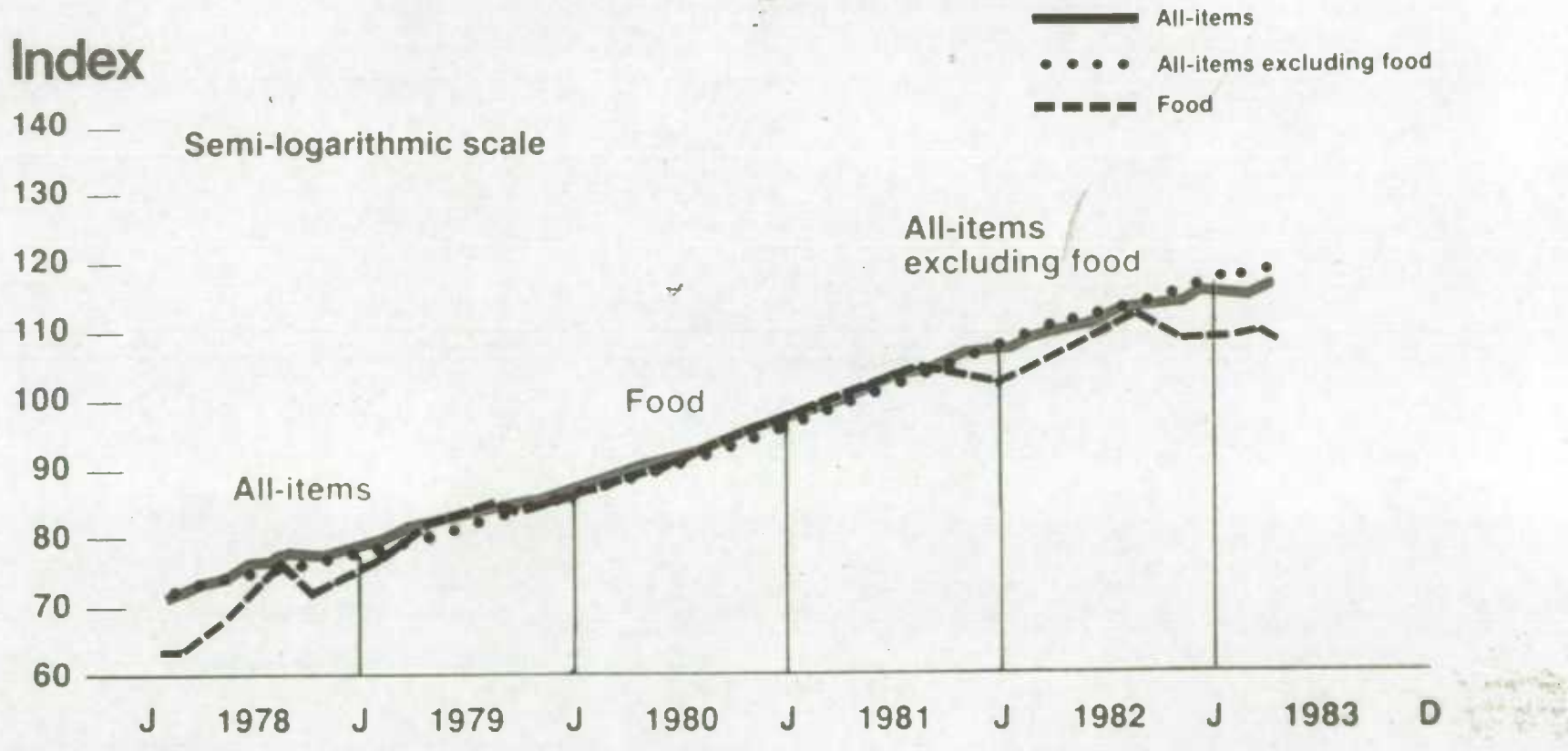
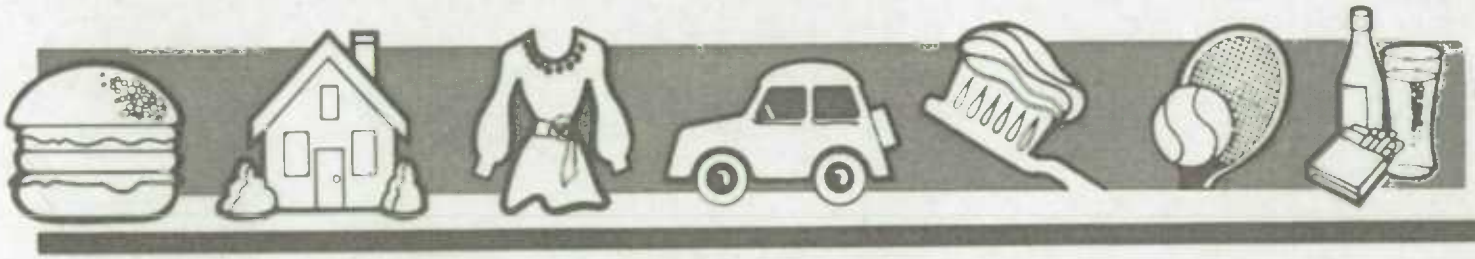
# THE CONSUMER PRICE INDEX FOR CANADA (1981=100)

## Not seasonally adjusted





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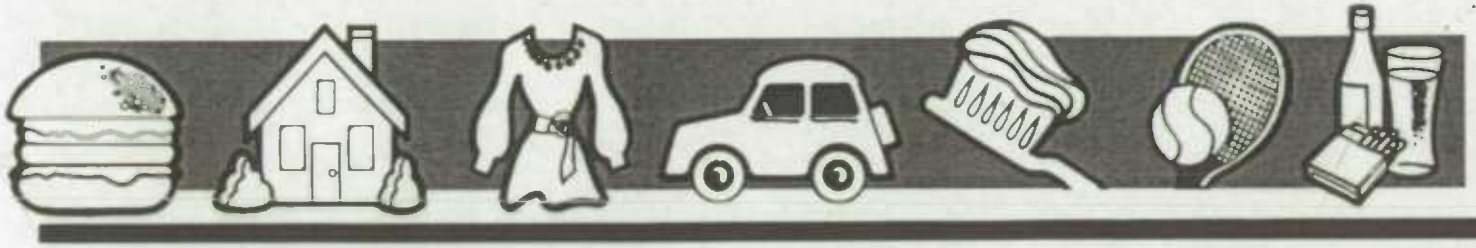
# PERSONAL INCOME TAX EXEMPTIONS
## INDEXING RATES AND AMOUNTS

| | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|
| | Base Year | * 6.6% | * 10.1% | * 11.3% | * 8.6% |
| Basic Exemption | 1600 | 1706 | 1878 | 2090 | 2270 |
| Married Exemption | 1400 | 1492 | 1644 | 1830 | 1990 |
| Age Exemption | 1000 | 1066 | 1174 | 1310 | 1420 |
| Under 16 | 300 | 320 | 352 | 390 | 430 |
| Over 16 | 550 | 586 | 646 | 720 | 780 |

*Based on the average CPI for the 12 months ending in September of the previous year, as a percentage of the average CPI for the 12 months before that.



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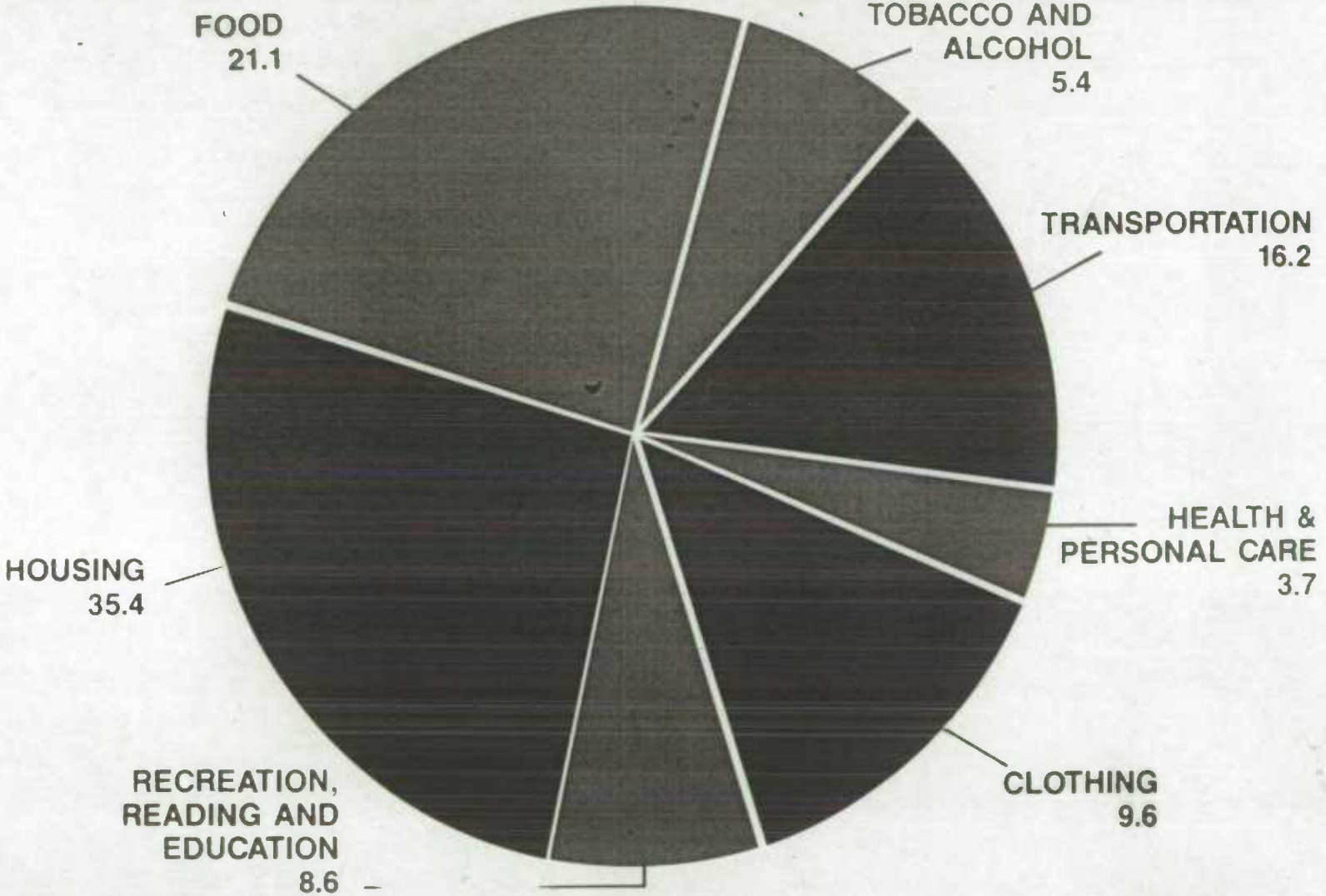
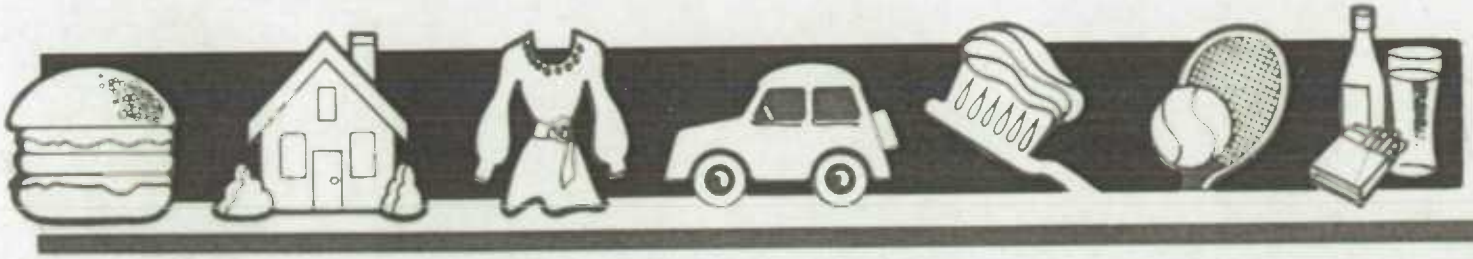
# WEIGHTS OF MAIN CATEGORIES:





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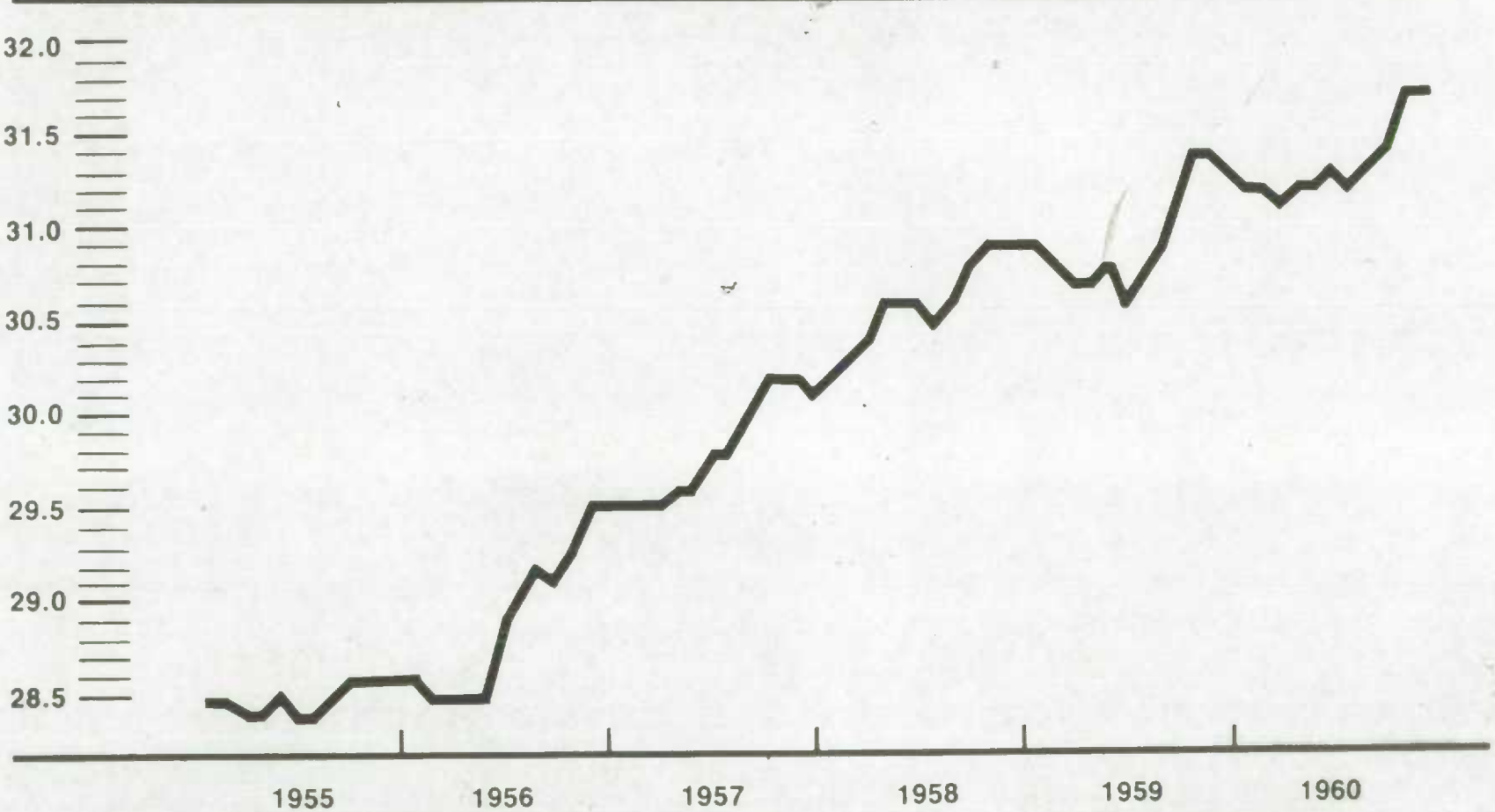
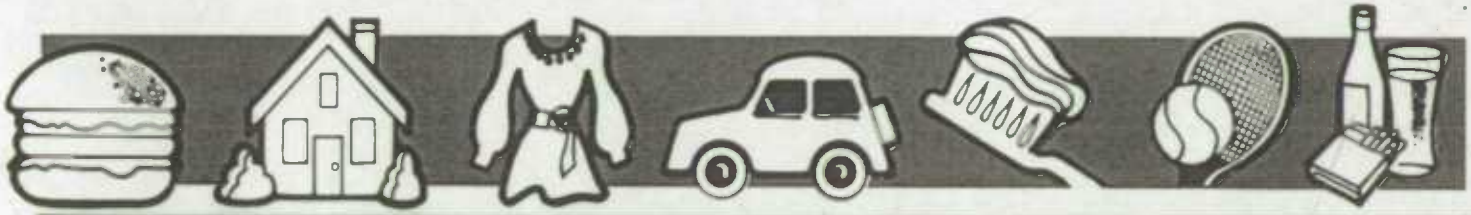
# CONSUMER PRICE INDEXES FOR CANADA (1981=100)





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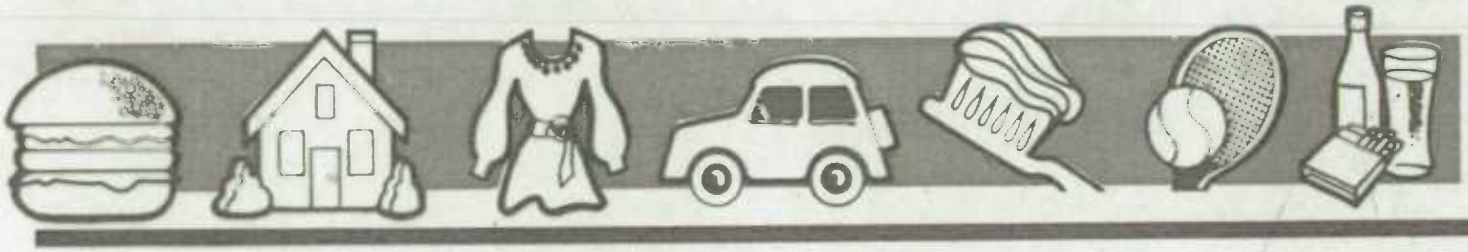
# CPI'S FOR OTHER TARGET GROUPS
## ALL-ITEMS INDEXES QUITE SIMILAR

| | Official CPI | Low-income CPI |
|---|---|---|
| Sept. 1978 | 100.0 | 100.0 |
| 1979 | 107.7 | 107.7 |
| 1980 | 118.7 | 118.0 |
| 1981 | 133.5 | 131.7 |
| 1982 | 147.9 | 144.7 |

The All-Items indexes are very similar. Throughout 1980, 1981 and 1982 the low-income CPI is slightly below the official CPI. This is chiefly because of different weights and rates of change for food, shelter and gasoline.



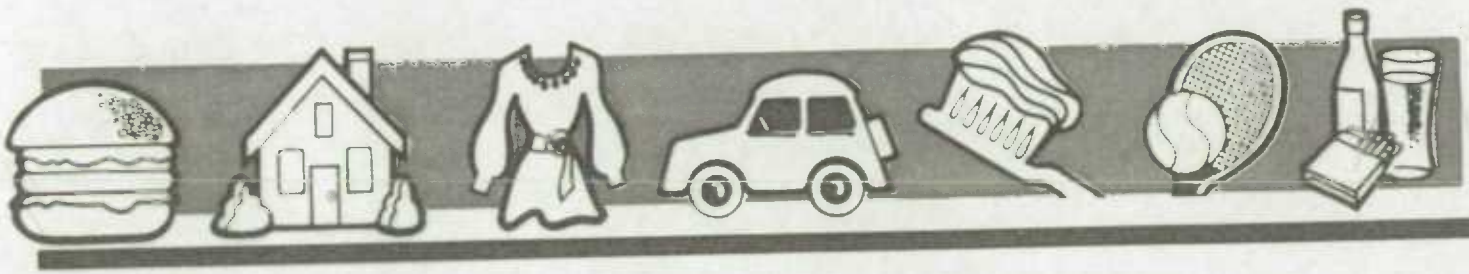
Canada's Consumer Price Index

# CALCULATING THE ALL-ITEMS CPI

## (Total Expenditure Assumed = $10,000)

| | A | B | C | D |
|---|---|---|---|---|
| | Amount Spent in Reference Period $ | Relative "Weight" % | Price Index March, 1983 Reference Period = 100 | Weight X Price Index (B X C) |
| Food | 2110 | 21.1 | 108.9 | 2297.79 |
| Housing | 3540 | 35.4 | 119 | 4212.6 |
| Clothing | 960 | 9.6 | 109.6 | 1052.16 |
| Transportation | 1620 | 16.2 | 119.7 | 1939.14 |
| Health and Personal Care | 370 | 3.7 | 116.6 | 431.42 |
| Recreation Reading and Education | 860 | 8.6 | 113.8 | 978.68 |
| Tobacco and Alcohol | 540 | 5.4 | 124.6 | 672.84 |
| | | | | 11584.63 |

Divide Total of Column D by 100
All-Items CPI = 115.8



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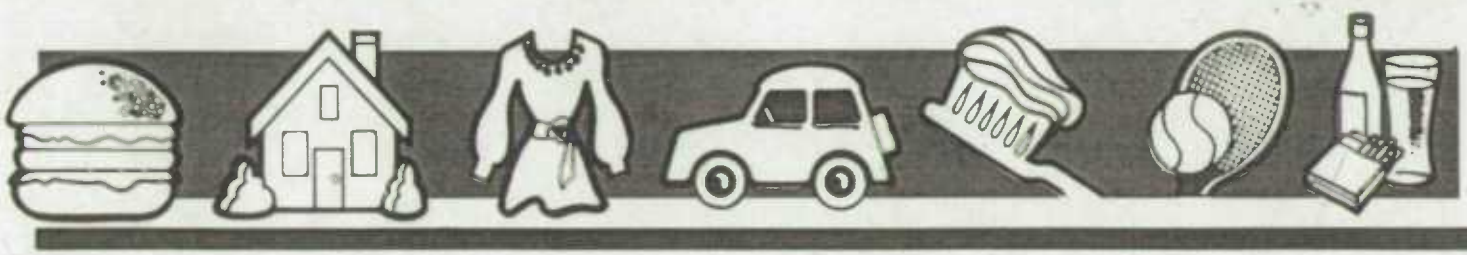
# FREQUENCY OF PRICE COLLECTION

| | |
|---|---|
| Food | Twice a month |
| Clothing<br>Pharmaceuticals<br>Gasoline | Once a month |
| Haircuts<br>Dry Cleaning | Once every three months |
| Automobile Insurance | Once every six months |
| Property Taxes | Once every twelve months |



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## CPI FORMAL DEFINITION

# THE CPI MEASURES THE *PERCENTAGE CHANGE* IN THE COST OF PURCHASING A *CONSTANT BASKET OF GOODS AND SERVICES* REPRESENTATIVE OF *CANADIAN URBAN HOUSEHOLDS* IN A *SPECIFIED TIME PERIOD.*


| Selected Items | 1971 | 1976 | 1982 |
|---|---|---|---|
| Ground Beef | 34.8 | 38.3 | 92.9 |
| Wieners | 32.2 | 46.7 | 105.0 |
| Chicken | 32.1 | 60.7 | 102.6 |
| Canned Tuna | | 46.3 | 115.3 |
| Milk | 36.6 | 63.2 | 109.0 |
| Cheddar Cheese | 33.1 | 59.8 | 115.2 |
| Eggs | 37.8 | 70.9 | 98.7 |
| Breakfast Cereal (Prepared) | 37.6 | 61.4 | 109.4 |
| Bread | 31.5 | 53.4 | 105.1 |
| Apples | 32.9 | 53.2 | 132.1 |
| Bananas | 27.7 | 46.6 | 97.4 |
| Frozen Orange Juice | 38.2 | 47.0 | 110.7 |
| Potatoes | 17.6 | 38.6 | 79.8 |
| French Fries (Frozen) | | 67.2 | 112.5 |
| Baked Beans (Canned) | 34.7 | 59.2 | 116.4 |
| Confections (from Stores) | 27.3 | 48.7 | 104.9 |
| Peanut Butter | 24.3 | 38.6 | 91.7 |
| Soft Drinks (from Stores) | 36.6 | 56.4 | 105.4 |
| Food (from Restaurants) | 37.4 | 65.9 | 110.2 |
| Snacks | | 64.1 | 110.4 |
| Telephone Service | 68.4 | 80.6 | 111.5 |
| Postage | 41.4 | 51.5 | 172.6 |
| Women's Coats and Jackets | 46.2 | 64.1 | 103.5 |
| Women's Footwear | 51.0 | 65.3 | 105.3 |
| Men's Pants | 57.5 | 74.4 | 106.1 |
| Men's Footwear | 46.0 | 63.4 | 105.0 |
| Dry Cleaning | 39.9 | 66.3 | 108.7 |
| Gasoline | 30.6 | 48.9 | 121.4 |
| Vehicle Insurance Payments | 41.3 | 70.9 | 127.3 |
| Public Transportation | 42.6 | 61.7 | 119.9 |
| Dental Care | 40.7 | 64.1 | 111.5 |
| Men's Hairstyling | 35.9 | 63.0 | 109.4 |
| Women's Hairdressing | 40.5 | 61.7 | 106.6 |
| Home Entertainment Equipment | 77.4 | 84.0 | 105.1 |
| TV Sets | 106.6 | 95.3 | 100 |
| Admission to Movies | 45.9 | 75.4 | 109.2 |
| Outdoor Recreation Equipment | 46.9 | 66.8 | 107.6 |
| Bicycle Purchase and Operation | 56.7 | 73.0 | 105.9 |
| Magazines | 35.6 | 59.4 | 114.4 |
| Education | | 74.1 | 110.1 |
| All-Items | 42.2 | 62.9 | 110.8 |

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1981 = 100

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