Percentages of our lives

Overview

This activity introduces a range of percentages related to adult life in Australia whist exploring the meaning of 'percent' as well as common diagrams used to represent percentages. It is an activity rich in opportunities for small group and whole class discussion: a worthwhile variation from individual calculation exercises.

For higher level numeracy students or Australian workplace learners it can be an interesting, adult appropriate introduction to percentages. It provides a chance to:

- Observe learners' existing knowledge of percentage concepts
- Explore and clarify some percentages which affect students' lives
- Build a strong foundation for 'in the head' percentage calculations.

For less experienced numeracy students the activity can be used during a series of percentage activities. It provides a chance to:

- Revise and reinforce percentage concepts
- Explore percentages affecting students' lives
- Introduce common diagrams used for representing percentages.

Skills and Knowledge

- Common percentages in the community
- Meaning of percentage as per hundred
- Percentages in diagram form

Preparation and Materials

Copy Activity Sheets 1 (Set 1), 2 & 3 (Set 2) onto stiff paper or card, cut them into pieces and place Set 1 and Set 2 in separate envelopes (1 for each pair or small group of students).

Cut also some blank pieces of paper or card roughly the same size as the cards on Activity Sheet 2 (2 per pair or small group of students).

Suggested Procedure

Introducing the activity

Arrange students in small groups around flat tables (preferably 4 per group).

Explain:

- *This activity is just a way to start with what you know already about percentages*
- *I do not expect you to know all of these facts yet*
- *You may be able to share quite a bit of knowledge between you*
- *At the end of the session you will hopefully have learned something new*

Matching Set 1

Give out one of the envelope labelled '*Set 1*' to each group.
Ask them to empty the contents on the table.
Hold up an example of each type of card and explain:

- *Some cards have words and some have percentages.*
- *Your first task is to match each of the word cards with the most likely percentage.*

Circulate as they work to:

- Encourage discussion
- Observe existing knowledge about percentages in the community.

Responding to existing knowledge

If students know **over half** of the responses without help, then proceed with the steps outlined below.

If they know **less than half** of these then assist them to finish the task together. You can then use another approach to introduce percentages, such as the *Matching Percentages* activity or use a couple of the cards that they do know to explore the meaning of percentage.

Note: It is possible that with time, or in some locations, the percentages will change. This should not matter because it will promote discussion. Students could vote on the response they accept today and come back next time with accurate figures to settle any disputes.

Discussing the first set

When all groups have finished matching the cards compare responses and discuss any disagreements together.

Ask students to leave the cards laid out on the table for the next part of the activity.

Using set 2

Distribute the second set of cards to each group and ask them to match the explanatory sentences and the diagrams with the pairs already on the table.

Explain that:

- *The blank card is there on purpose*
- *There are spare diagrams that you will not use*

Note: There are spare diagrams in Set 2 to provoke discussion and thought.

Circulate and observe carefully which cards are easy for the students to place and which sets reveal misunderstandings or dilemmas that may need addressing later. Assist with hints where necessary.

Note: Students who have only been able to identify a small number in Step 1 could just look for cards which go with their items and ignore the rest.

100% - Pure new wool *Completely one thing* The main point to be made is that 100% means the whole lot.	Ask learners what other labels or advertising they have seen like this. Examples may be 100% cotton or even 100% synthetic fibre. 100% orange juice is also common, which of course means it should have nothing else in it.
150% - Time and Half Overtime Rate - $12 becomes $18 Many people are confused at the idea of more than 100% or more than the whole.	This means that you are paid all of what you are normally paid (100%) and then an extra 50% as well. The diagram should help clarify this.

.05% - Blood Alcohol Content This is one of the most familiar percentages in our society. It is best to emphasize the meaning as a very small amount – less than 1 in every 100 – because its exact meaning is more likely to confuse than help [it really means that in every litre of blood (1000 ml) there is half of a ml (.5ml) of alcohol].	What should be clear is that 1% means 1 out of 100 and .05% means only 0.05 or 5 hundredths out of every 100. This should be clear from the diagram, which shows 5 hundredths of 1 and that it is indeed a very small amount. It is worth stressing however, that even this seemingly very small amount of alcohol is enough to affect the judgement and responses of drivers.

Discussing Set 2

Compare responses as a whole class. Some ideas that may provoke discussion are:

Consolidating the meaning of 'percent' age

Make sure that the relevance of 100 in some of the explanatory sentences is made really clear at this point.

Remind students that 'per cent' means 'per 100' or 'in every 100'.

You could reinforce this by brainstorming other words that contain 'cent'.

Responses may include 'century' – 100 years, 'centigrade' – 100 degrees in the scale, centimetres – there are 100 of them in a metre, centipede – supposedly 100 legs...

Discussing the diagrams

Ask:

- *Which diagrams make the 100 meaning clearer?*
- *Which diagrams are familiar?*
- *Where do you see them?*

[The 100 square grids allow us to see the 100 meaning. The circles are similar to pie graphs that we often see in the media.]

Filling in the blank card

Ask the groups:

- *Where have you put the blank card?*

[Should be with the cards for the 4% wage rise]

- *As a group create a sentence that could go with this set*
- *Look at the other sentence cards to help you*

Ask each group to read out their sentence. Write it on the board.

Ask:

- *Look at these different responses*
- *Discuss them in your group*
- *Decide whether or not you agree with them*

Note: There is not only one correct response to this, so comparing answers can help to explore the meaning of percentages and indicate that different people come up with different ways of explaining it.

Emphasising per 100

To ensure students understand the meaning of 'per cent' emphasise any responses similar to: *'$4 extra for every $100 now'*.

Explain:

- *This is a powerful idea that helps you to calculate percentages in your head*

If no-one has put forward such a response, ask the whole class to:

- *Suggest another possible sentence that has the number 100 as part of it.*

This basis for a shortcut or 'in the head' method of calculating percentages is explored in the following activity: *Shortcut percentages: The 'per 100' method.* It is best done as soon as possible after this activity.

✂ Copy onto card and cut.

A wage or pension rise	4%
Blood alcohol content	0.05%
A personal loan interest rate	17.5%
Time and a half overtime rate	150%
Pure new wool	100%
GST in Australia	10%
Half price sale	50%

✂ Copy onto card and cut.

A pay rate of $12 per hour becomes $18 per hour
A product normally costs $60 but now costs $30
Every year you have to pay almost $18 for each $100 that you owe.
A percentage much lower than 1%
Completely one thing
10 cents tax is added to every one dollar of the actual price

Set 2 (cont.)

✂ Copy onto card and cut.