

NUMERACY

TITLE: Ratios, proportions and percentages

AGE GROUP: 7 – 8

DURATION: 30 – 45 minutes

LEARNING OUTCOME: L03

KEY CONCEPTS: Applying fractions, proportions and percentages

The aim of this session is to give learners an intuitive image of fractions, proportions and percentages. It builds on the idea of fractions from the previous activity and gets learners to apply numbers, fractions and percentages when thinking about things that they are familiar with. In a subtle way, it all relates to money.

MATERIALS NEEDED:

1. Writing materials – pen, pencil, paper
2. Microsoft Excel or similar spreadsheet

LESSON DESCRIPTION:

There is scope for the facilitator to adapt the activity by changing the base price of the pizza so that learners can have added practice at the application of fractions and percentages. Each learner will attempt the task below. Facilitators could remind learners of the concepts that will be useful in solving the problem. It is recommended that learners produce their individual answers.

Activity

- (a) Mum is buying pizza for dinner today. A medium pizza is 12 inches wide in diameter and costs £10.
- (i) What is the cost of one half, $\frac{1}{2}$ or 50% of the pizza?
 - (ii) What is the cost of one quarter, $\frac{1}{4}$ or 25% of the pizza?
 - (iii) What is the cost of one fifth, $\frac{1}{5}$ or 20% of the pizza?
- (b) Mum buys two pieces of the 12-inch pizza and the total price was £18! The difference between the actual price of the two pizzas (£18) and two individual pizzas ($\text{£}10 \times 2 = 20$) is called a **discount**.

Clues and keywords:

$$1 / 2 = 50/100 = 0.50$$

$$1 / 4 = 25/100 = 0.25$$

$$1 / 5 = 20/100 = 0.20$$

$$1 / 3 = 33.33/100 = 0.33$$

Discount: The amount or percentage taken off the price of an item.

n%: where 'n' is any number:
 $n/100$

- (i) Compare the **discount** with the actual total price (£18) and state your answer as a percentage.
- (ii) Calculate the cost of $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{5}$ of each pizza (after the discount)
- (iii) Did you know that you could find the answer to question ii above if you had done the following: 100% minus discount percentage multiplied by total cost of the pizzas without the discount?

Calculate the cost of $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{5}$ of the pizza this way and show your answers below.

A1: Fractions and equivalents

(a) $\frac{1}{2}$ of 10 = $\frac{10}{2}$ = 5
 $\frac{1}{4}$ of 10 = $\frac{10}{4}$ = $\frac{5}{2}$ = 2.5
 $\frac{1}{5}$ of 10 = $\frac{10}{5}$ = 2

(b)

(i) £20 - £18 = £2
 $\frac{2}{20} \times 100 = \frac{200}{20} = 10\%$

(ii) £18 / 2 = 9; $9 \times \frac{1}{2} = \frac{9}{2} = 4.5$
 $\frac{£18}{2} = 9 \times \frac{1}{4} = \frac{9}{2} = 4.5/2 = 2.25$
 $\frac{£18}{2} = 9 \times \frac{1}{5} = \frac{9}{5} = 1.8$

(iii) Cost of one-half = $(100\% - 10\%) \times \frac{£20}{2} \times \frac{1}{2}$ [Use BIDMAS]
 $90\% \times £20 = \frac{90}{100} \times £20 = \frac{1900}{100} = £18.00$
 $\frac{18}{2} = £9$
 $£9 \times \frac{1}{2} = £4.5$

Cost of one-quarter $(100\% - 10\%) \times \frac{£20}{2} \times \frac{1}{4}$
 $90\% \times £20 = £18$
 $\frac{£18}{2} = £9$
 $£9 \times \frac{1}{4}$
 $\frac{£9}{4} = £2.25$

Cost of one-fifth $90\% \times £20 \times \frac{1}{5}$
 $\frac{£18}{2} = 9$
 $£9 \times \frac{1}{5} = \frac{£9}{5} = £1.8$