

Lesson plan

Work with equivalent fractions, decimals and percentages and find percentages of an amount

Level 2

1. Lesson objectives

- Working with equivalent fractions, decimals and percentages using multiple representations
- Calculate benchmark percentages and apply bar models to solve percentage of an amount problems (non-calculator)

2. Functional Skills Level 2 curriculum

Using numbers and the number system

- 4 Identify and know the equivalence between fractions, decimals and percentages
- 5 Work out percentages of amounts

3. Lesson plan

This is an overview of the lesson. More notes can be found in the notes in the lesson slides.

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Introduction	Introduction to fraction, decimal and percentage equivalence	5	Lead a discussion on how to identify what is wrong with Yaima's statement. How do the learners know it is wrong? How can they prove it?	Slide 2 Mini whiteboards
Model	Introduce the 100-grid representation for percentages, fractions and decimals	10	Tutor introduces the 100-grid, where 50% is modelled as five tenths i.e. five lines of 10 small squares. Tutor asks the learners to connect numbers being out of 100 to percentages and explore other equivalent fractions and decimals, before asking for other multiples of tenths e.g. 30%. What would that look like? Slide 4 shows tenths and hundredths and learners think about the value of 12 hundredths or one tenth and 2 hundredths, and its equivalent decimal and percentage i.e. 0.12 and 12%. Slide 5 introduces 5% on the hundred grid to discuss the decimal placing. If 50% is 0.5 then what is 5%? Put the emphasis on place value. In the next four slides, learners complete a 'true or false' task as a think-pair-share activity and feed back to the tutor. Slide 10 introduces using a calculator. Learners are to think about who performed best in a test and tutor is to encourage class about the different methods that the learners used to compare the fractions.	Slides 3–10 Mini whiteboards

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Explore 1	Collaborative exploration to develop thinking and reasoning skills for fractions, decimals and percentages	15	This task checks learners' understanding of fractions, decimals and percentages, especially where they are not able to recall the exact values. Learners will have the opportunity to use reasoning and thinking skills. Learners work in pairs and are given 48 Tarsia cards to create 12 squares with 4 equivalent values. This activity is an important building block for the construction of knowledge for fractions, percentages and decimals, and allows learners to practise problem solving and calculation skills that they will need for the non-calculator paper.	Slide 11 Handout 1 Tarsia activity
Discuss 2	Exploration of problem-solving approaches to find match equivalent fractions, decimals and percentages	5	Tutor shows the completed Tarsia and asks groups for feedback. How did learners do them? Which ones were challenging?	Slide 12
Explore 2	Collaborative exploration to develop the use of bar models by matching bar models to the appropriate question	15	The tutor introduces exact fractions, decimals and percentages in the representation of a bar model. Learners are asked to use the values in the bubble and additional values of their choice to draw bar models with values which add to 1. In pairs or groups, learners draw bar models to add to 1. The focus of this task is sketching bar models (not accurate) to represent their calculations.	Slides 13–14 Flip chart paper Marker pens

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Discuss	The discussion aims to deepen learners' understanding of using bar models	10	Tutor asks for feedback using the diagrams to explore learners' thinking and reasoning. Look for any misconceptions, particularly $\frac{1}{5}$, $\frac{1}{8}$ and $\frac{1}{20}$ equivalence. Emphasise place value when drawing the bar models. In Slide 16, Learners understand 75% is $\frac{3}{4}$, therefore a bar is split into 4 sections. Slides 17–18 allow further investigation into how the bar model can be divided. Slide 19 allows the tutor to model a context question where bar models could be used to help find the solution. This can be done by the tutor on the whiteboard, or with the aid of the PowerPoint which provides the explanation of this.	Slides 15–19
Explore 3	Use bar models to solve word problems using fraction, decimal and percentage equivalence	15	In pairs learners complete the questions. Do not unnecessarily prompt; allow learners to try and become unstuck for themselves.	Slide 20 Handout 2
Discuss	The discussion aims to deepen learners' understanding of equivalence	5	Tutor asks learners for feedback and works through the answers with them. How did they do? What questions were difficult and why?	Slides 21–25

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Practice question	Learners check and consolidate their understanding by answering exam questions	5	Give learners time to work independently on the questions. Depending on the time and the ability of the learners in the group, you may choose only one of the three questions for the class. After learners have had enough time to attempt the questions, ask them whether they have used a different approach, to that used prior to the lesson. How has their thinking changed? What have they learned? When might they use this approach again in the future?	Slides 26–29 Practice questions handout
Review	Summarise learning, capture ways of thinking and clarify the concept of equivalence for fractions, decimals and percentages	5	Summarise the learning. - Clarify the concept of equivalence for fractions, decimals and percentages. - Capture the ways of thinking for problem-solving. Draw on the examples from the earlier slides on the main whiteboard. Would they use bar models in the future? It is important to make sense and capture learners' ways of thinking – not to prescribe a best method. The lesson should have helped learners understand why bar models can be helpful in these types of question. The purpose of this lesson was to give them new ways of thinking so that they can answer harder problem-solving questions under the pressure of an exam.	Slide 30