CENTRES FOR EXCELLENCE IN MATHS

FE centre resource

Pearson

Lesson plan

Scales, maps and units

Level 1

1. Lesson objectives

- To be able to convert metric units of measurement
- To be able to use a scale to find lengths
- To be able to represent a proportional situation in a ratio table.

2. Functional skills Level 1 curriculum

Using numbers and the number system
17 work with ratio and direct proportion

Using common measures, shape and space
21 recognise and make use of simple scales on maps and drawings

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 different metric units of length	10	Launch the activity by telling learners that having a basic understanding of different measurements is very useful in everyday life. Give examples, e.g. telling your hairdresser how much you want to cut off if you are having a trim, buying the correct screws for a DIY job etc. Learners recap on metric measurements (mm, cm, m and km) and choose the most appropriate measurement of choices provided. Class discussion on conversions of units when reviewing.	Slides 2 and 3 Handout 1: Find the measurements
Model	To introduce the concept of measurement and how to change freely between different units using ratio tables	5	Tutor models reading a scale on a ruler and then how to change between cm and mm and cm to metres. Tutor shows learners ratio tables to support converting metric units of lengths which are then used to explain their thinking.	Slide 4
Explore 1	Collaborative exploration to develop the concept of scale using rulers to measure	10	In pairs, learners explore how to represent the lengths in different measurement units, carefully reading the scales on the rulers.	Slide 5 Handout 3: Reading scales and converting metric units

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Discuss 1	Deepen learners' understanding of how to use a ruler to measure distances	5	Groups feedback on the measurement exploration and confirm their answers. How to explore different graduation scales is addressed.	Slide 6
Explore 2	Misconception – not knowing when to divide or multiply before problem-solving tasks	5	Independently at first, and then in pairs, learners look at Rahima's mistake. Can they explain why she is not correct? Can they use ratio tables to explain their thinking?	Slide 7 Handout 2: Rahima's mistake
Discuss	Deepen learners' understanding of how to use ratio tables to convert between units	5	Tutor asks learners for their feedback. Slides can be used for illustration of a range of approaches, not limiting to ratio table.	Slide 8
Introduction to Explore 3 activity	Introduction to using scales which then leads onto the activity	5	Show learners the scale drawing of the bedroom and the scale that has been used. Model how to convert the units of the actual bed (metres) to the ones in the scale drawing (centimetres) and then find the measurements for the scale version of the bed. The example shown does not neatly fit into the scale as the bed works out as 2.8 cm in length. Look out for students who do not know how to approximate this length using the 1 cm grid paper provided.	Slide 9

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Explore 3	Collaborative exploration to develop the use of scales given in the form 1 : *n* to solve the dimensions of scale furniture	20	In pairs students decide which items of furniture they want to have in their room and use the scale to work out the dimensions of the scaled down items. Encourage students to use ratio tables to organise their thinking and working. Students should then draw their furniture on the grid and label each piece. They can then either redraw it on the bedroom plan in the place they want it or cut out the furniture and stick it on the plan to allow them to move things around before making a final design.	Slide 10 Handout 4: Bedroom design
Discuss 3	To deepen learners' understanding of how to use scales given in the form 1 : *n* to calculate scaled distances	10	Review the student's final designs. This could be showing them to the class using a visualiser or getting students to walk around and look at each other's. Ask students to model their working for one piece of furniture on the board.	Slide 10 Handout 4: Bedroom design
Explore	To understand how scale works on online maps	5	Maps and technology Teacher opens up a Google map of the local area and students do the same on their phones or follow what's on the board. Choosing two fixed points to travel between. Can they see the scale? How is this different to the scales we have seen so far? What happens to the scale when you zoom in or out? Estimate, using the scale, how far it is between the two points.	Slide 11

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Exam questions	Exam questions	5	Students will work independently on the exam questions. Check the answer on the next slide. Ask students whether they have used a different approach to that used prior to the lesson. How has their thinking changed? Would or when might they use this approach again in the future?	Slides 12–15 Handout 5: Exam questions
Review	Summarise learning, to capture ways of thinking and to clarify the concept of reading and interpreting scale, maps and units	5	Summarise the learning. • Clarify the concept of measurement and the use of ratio tables • Capture the ways of thinking about measurement. Draw on the examples from the slide on the main whiteboard. 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 how to apply the rules of conversion in stages using ratio tables and given them a way of thinking to be able to answer these sorts of questions under the pressure of an exam even if they cannot remember how to convert e.g. from mm to metres in one step.	Slide 16