Ratio and proportion matching task

2:1	Altogether, there are three equal parts of the whole amount to think about.	4 out of a group of 6 people live in Tower Hamlets & 2 live in Waltham Forest.
1:3	Altogether, there are four equal parts of the whole to think about.	¼ of the paint mixture is red & ¾ of it is yellow.
7:3	Altogether, there are ten equal parts to think about.	In a factory, 210 of the lightbulbs they tested worked, but 90 didn't.
1:2:3	Altogether, there are six equal parts to think about.	In a recipe, water, sugar & flour are mixed together so that there is three times as much flour as there is water, and half as much water as there is sugar.

Ratio and proportion matching task
Teaching notes and Functional Skills mapping

A card matching task in which students interpret practical scenarios involving proportional relationships in terms of ratios and the total numbers of equal parts involved in them.

In pairs, they move the cards/paper slips around and discuss how to match four ratios (white) with the four statements about parts (blue) and the four practical situations and actual amounts which correspond with them (yellow).

Some of the details in the scenarios could be adapted to suit their local environment or learning context. The sheet could be printed out for each student to self-check after the activity, and to keep for later reference.

Subject content - FUNCTIONAL SKILLS MATHEMATICS

✓ indicates content covered by this resource, although this will vary with the student group and how the resource is used by the teacher. ✓✓ = a key (learning objective). → = not specifically covered but included to show progression across levels. *Content at each level subsumes and builds upon the content at lower levels.*

Fundamental mathematical knowledge and skills: these must be demonstrated in their own right, **both with and without a calculator**, in addition to being used to solve problems or complete tasks.

Entry Level 3	Level 1	Level 2
Using numbers and the number system – whole numbers, fractions, decimals, percentages		
E3.7 Read, write and understand thirds, quarters, fifths and tenths including equivalent forms →	L1.17 Work with simple ratio and direct proportions ✓✓	L2.11 Understand and calculate using ratios, direct proportion and inverse proportion ✓✓

Mathematical problem solving (at all levels of Functional Mathematics)

Although underpinning knowledge is tested in its own right, problem solving (p-s) is a core element of Functional Skills mathematics yet should not obscure or add additional mathematical complexity beyond the level of the qualification. Defining p-s is a challenge but the attributes below are helpful. Not all (in fact often just one) of the listed attributes must be present in a single task for it to be considered to be p-s.

✓ indicates why all or parts of this resource can be considered to be problem solving.

One or more of the following attributes may be present in a single task for it to be considered problem solving	
A Tasks that have little or no scaffolding: there is little guidance given to the student beyond a start point and a finish point. Questions do not explicitly state the mathematical process(es) required for the solution.	✓
B Tasks that provide for multiple representations, such as use of a sketch or a diagram as well as calculations.	
C The information is not given in mathematical form or in mathematical language; or there is a need for the results to be interpreted or methods evaluated, for example, in a real-world context.	✓
D Tasks have a variety of techniques that could be used.	✓
E The solution requires understanding of the processes involved rather than just application of the techniques.	✓

Source: DfE (Feb 2018), Subject content functional skills: mathematics *(comes into effect September 2019)*
https://www.gov.uk/government/publications/functional-skills-subject-content-mathematics

Ratio and proportion matching task
Teaching notes and Functional Skills mapping

Solving mathematical problems, carrying out tasks and decision making.		
Entry Level 3 students are expected to be able to:	**Level 1 students** are expected to be able to:	**Level 2 students** are expected to be able to:
Use the content knowledge and skills to recognise and obtain a solution or solutions to a:		
[1]**simple problem**	[2]**straightforward problem**. ✓	[3]**complex problem.**
E3a. Use given mathematical information including numbers, symbols, simple diagrams and charts.	L1a. L2a. Read, understand and use mathematical information and mathematical terms used at this level ✓	
E3b. Recognise, understand and use simple mathematical terms appropriate to Entry Level 3.	L1b. L2b. Address individual problems as described above ✓	
E3c. Use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy.	L1c. L2c. Use knowledge and understanding to a required level of accuracy	
E3d. Present results with appropriate explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.		L2d. Identify suitable operations & calculations to generate results ✓
	L1d. L2e. Analyse and interpret answers in the context of the original problem ✓	
	L1e. L2f. Check the sense, and reasonableness, of answers ✓	
	L1f. Present results with appropriate explanation and interpretation demonstrating simple reasoning to support the process & show consistency with the evidence presented	L2g. Present results and explain results clearly and accurately demonstrating reasoning to support the process and show consistency with the evidence presented

[1]A **simple mathematical problem** requires **working through one step or process**. At Entry Level it is expected that students will be able to address individual problems each of which draw upon knowledge and/or skills from **one** MCA (NS, MS or HD).

Context should be familiar to all students and easily described.

KEY:
MCA = appropriate mathematical content area(s).
NS = Using numbers and the number system.
MS = Using common measures, shape and space.
HD = Handling information and data.

[2]A **straightforward problem** requires students to either work through one step or process **or to work through more than one connected step or process**. Individual problems are based on the knowledge and/or skills in the MCA (i.e. NS, MS or HD). At Level 1 it is expected that the student will be able to address individual problems, some of which **draw upon a combination of any two of the MCA** and require students to make connections between those content areas.

The context of individual problems at L1 will require some comprehension in order for the student to be able independently to identify and carry out an appropriate mathematical approach.

[3]**A complex problem** requires **a multi-step process, typically requiring planning and working through at least two connected steps or processes**. Individual problems are based on a combination of the knowledge and/or skills from the MCA (NS, MS or HD). At Level 2 it is expected that the student will be able to address individual problems some of which draw upon a combination of **all three MCA** and require students to make connections between those content areas.

The context of individual problems at L2 will require interpretation and analysis in order for the student to be able independently to identify and carry out an appropriate mathematical process or processes.