

# Pancake proportions

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Information sheet

You need this sheet to answer all the questions except Q8.

### Next Tuesday is Pancake Day!

The Black Bull Inn has a special  
Shrove Tuesday lunch / dinner menu



Lunch: 11am - 3pm  
Dinner: 6.00pm - 9.30pm

### Blueberry sauce

3 cups blueberries  
1 cup water  
½ cup sugar  
1½ tablespoons corn flour  
mixed with 3 tablespoons  
lemon juice  
½ teaspoon vanilla extract

### Black Bull Inn: pancake recipes

	Traditional	Vegan	Gluten-free
Makes:	100 pancakes	15 pancakes	6 pancakes
	1kg plain flour	225g plain flour	120g rice flour
	1 tbs salt (15g)	1 tsp salt (5g)	¼ tsp salt
	20 eggs	675ml almond milk	90ml milk
	2 litres milk	5 tbs vegetable oil	1 tbs vegetable oil
	750 ml water		2 eggs

**Abbreviations:** tbs = tablespoon (1tbs = 15 ml). tsp = teaspoon (1tsp = 5ml)

### Hot chocolate sauce for pancakes:

Use cocoa powder and caster sugar in a ratio of 6:11

Whisk the sugar, cocoa powder and a dash of hot water together in a small pan over a gentle heat.

Add extra water depending on how thick you require the sauce.

Chocolate sauce adapted from [https://www.bbc.co.uk/food/recipes/pancakeswithchocolat\\_76457](https://www.bbc.co.uk/food/recipes/pancakeswithchocolat_76457)

Blueberry sauce adapted from <https://www.cheatsheet.com/culture/easy-pancake-toppings-better-syrup.html/>



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## Part A: Proportion (Level 1 non-calculator)

1. How many eggs do you need to make 3 **gluten-free pancakes**?

Show your working out and your answer in the box.

(L1.17 - 2 marks)

2. How much milk do you need to make 2 **gluten-free pancakes**?

Show your working out and your answer in the box.

(L1.17 - 2 marks)

3. There is only 1500 ml milk in the Black Bull kitchen.

- a. How many **traditional pancakes** can the chef make?

Show your working out and your answer in the box.

- b. Show a check for one of your calculations in 3a.

(L1.17 - 4 marks)

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## Part B: Proportion (Level 1). You may use a calculator.

4. The head chef makes a chart so that Black Bull kitchen staff know how to make smaller and larger batches of the vegan pancake mix.

Complete the information in the chart. You **must include units** of measure.

Use this box to show all your working out.

(L1.17 - 4 marks)

VEGAN PANCAKES			
To make:	30 pancakes	3 pancakes	12 pancakes
Plain flour			
Salt		1g	
Almond milk			
Vegetable oil			4 tbs (or 60ml)

(L1.17 - 10 marks)

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## Part C: Ratio (L1-2). Show your working out.

Give all answers in the simplest form. A ratio in simplest form can only have whole numbers.

### 5. Blueberry sauce recipe

a. What is the ratio of water to blueberries?

\_\_\_\_\_ : \_\_\_\_\_

(L1.17 - 1 mark)

b. What is the ratio of blueberries to water to sugar?

\_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

(L2.11 - 2 marks)

c. What is the ratio of cornflour to lemon juice?

\_\_\_\_\_ : \_\_\_\_\_

(L2.11 - 2 marks)

### 6. Traditional pancake recipe

a. What is the ratio of water to milk in the traditional pancake recipe?

\_\_\_\_\_ : \_\_\_\_\_

(L1.17 - 3 marks)

b. What is the ratio of salt to plain flour?

\_\_\_\_\_ : \_\_\_\_\_

(L1.17 - 3 marks)

### 7. Hot chocolate sauce recipe

a. The head chef uses 30g cocoa powder to make the sauce.

How much sugar does he need? \_\_\_\_\_

(L2.11 - 2 marks)

b. A junior chef makes a larger batch of sauce. He uses 165g sugar.

How much cocoa powder does she need? \_\_\_\_\_ (L2.11 - 2 marks)

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## Part D: Direct and inverse proportion (L2). Show your working out.

8. A professional chef can make 40 pancakes in an hour.

a. How long would it take 2 chefs to make 40 pancakes? \_\_\_\_\_

(L2.11 - 2 marks)

b. How long would it take 5 chefs to make 600 pancakes? \_\_\_\_\_

(L2.11 - 3 marks)

9. 480 pancakes are eaten over the **lunchtime period** at the Black Bull Inn.

How many chefs were making pancakes? \_\_\_\_\_

(L2.11 - 4 marks)

10. Four chefs make pancakes over the entire **dinner session** at the Black Bull Inn.

How many pancakes do they make? \_\_\_\_\_

(L2.11 - 4 marks)

**Subject content – Reformed FUNCTIONAL SKILLS MATHEMATICS** (effective from Sept 2019)

✓✓ indicates **main content & problem-solving skill(s)** covered in this resource, although these may vary with the student group and how the resource is used by the teacher. ✓ = minor content. → = not covered but included to show progression across levels (*content at each level subsumes and builds upon the content at lower levels*). Only **number & number system** content is shown here. Full content (which also includes *Measures, Shape & space* and *Handling Information & Data*) at: DfE <https://www.gov.uk/government/publications/functional-skills-subject-content-mathematics>

**1. 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
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Using numbers and the number system (N)		
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<p>E3.1 Count, read, write, order and compare numbers up to 1000</p> <p>E3.2 Add and subtract using three-digit whole numbers →</p> <p>E3.3 Divide three-digit whole numbers by single and double digit whole numbers and express remainders →</p> <p>E3.4 Multiply two-digit whole numbers by single and double digit whole numbers →</p> <p>E3.5 Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results</p> <p>E3.6 Recognise and continue linear sequences of numbers up to 100</p> <p>E3.7 Read, write and understand thirds, quarters, fifths and tenths including equivalent forms →</p> <p>E3.8 Read, write and use decimals up to two decimal places</p> <p>E3.9 Recognise and continue sequences that involve decimals</p>	<p>L1.1 Read, write, order and compare large numbers (up to one million)</p> <p>L1.2 Recognise and use positive and negative numbers</p> <p>L1.3 Multiply and divide whole numbers and decimals by 10, 100, 1000</p> <p>L1.4 Use multiplication facts and make connections with division facts ✓</p> <p>L1.5 Use simple formulae expressed in words for one or two-step operations</p> <p>L1.6 Calculate the squares of one-digit and two-digit numbers</p> <p>L1.7 Follow the order of precedence of operators</p> <p>L1.8 Read, write, order and compare common fractions and mixed numbers</p> <p>L1.9 Find fractions of whole number quantities or measurements</p> <p>L1.10 Read, write, order and compare decimals up to three decimal places</p> <p>L1.11 Add, subtract, multiply and divide decimals up to 2 decimal places</p> <p>L1.12 Approximate by rounding to a whole number or to one or two decimal places</p> <p>L1.13 Read, write, order and compare percentages in whole numbers</p> <p>L1.14 Calculate percentages of quantities, including simple percentage increases / decreases by 5% and multiples thereof</p> <p>L1.15 Estimate answers to calculations using fractions and decimals</p> <p>L1.16 Recognise and calculate equivalences between common fractions, percentages and decimals</p> <p>L1.17 Work with simple ratio and direct proportions ✓✓</p>	<p>L2.1 Read, write, order and compare positive and negative numbers of any size</p> <p>L2.2 Carry out calculations with numbers up to one million including strategies to check answers including estimation and approximation</p> <p>L2.3 Evaluate expressions and make substitutions in given formulae in words and symbols</p> <p>L2.4 Identify and know the equivalence between fractions, decimals and percentages</p> <p>L2.5 Work out percentages of amounts and express one amount as a percentage of another</p> <p>L2.6 Calculate percentage change (any size increase and decrease), and original value after percentage change</p> <p>L2.7 Order, add, subtract and compare amounts or quantities using proper and improper fractions &amp; mixed numbers ✓</p> <p>L2.8 Express one number as a fraction of another</p> <p>L2.9 Order, approximate and compare decimals</p> <p>L2.10 Add, subtract, multiply and divide decimals up to three decimal places</p> <p>L2.11 Understand and calculate using ratios, direct proportion and inverse proportion ✓✓</p> <p>L2.12 Follow the order of precedence of operators, including indices</p>
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## 2. Mathematical problem solving (at all levels of Functional Mathematics)

Although underpinning knowledge is tested in its own right, problem solving is a core element of Functional Skills mathematics yet should not obscure or add additional mathematical complexity beyond the level of the qualification. Defining problem solving is a challenge but the attributes below may help. Not all (often just one) of the listed attributes must be present in a single task for it to be considered to be problem solving. ✓ indicates why all or parts of this resource can be considered to be problem solving. **Source:** DfE (Feb 2018) <https://www.gov.uk/government/publications/functional-skills-subject-content-mathematics>.

One or more of the following attributes may be present in a single task for it to be considered problem solving:	
<b>A</b> 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>B</b> Tasks that provide for multiple representations, such as use of a sketch or a diagram as well as calculations.	
<b>C</b> 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.	✓
<b>D</b> Tasks have a variety of techniques that could be used	✓
<b>E</b> The solution requires understanding of the processes involved rather than just application of the techniques.	✓

## Solving mathematical problems, carrying out tasks and decision making.

Entry 1 (E1)	Entry 2 (E2)	Entry 3 (E3)	Level 1 (L1)	Level 2 (L2)
Students are expected to be able to use the content knowledge and skills to recognise and obtain a solution to:				
<sup>1</sup> a simple problem ✓		<sup>2</sup> a straightforward problem ✓		<sup>3</sup> a complex problem
E1a. Use given mathematical information and recognise and use simple mathematical terms appropriate to E1	E2a. 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 ✓		L1b. L2b. Address individual problems as described above ✓
	E2b/3b. Recognise, understand and use simple mathematical terms appropriate to E2 / E3	L1c. L2c. Use knowledge and understanding to a required level of accuracy ✓		L1d. L2e. Analyse and interpret answers in the context of the original problem ✓
E1b. E2c. E3c. Use the methods given above to produce, check and present results that make sense [E3 only: to an appropriate level of accuracy].				L2d. Identify suitable operations and calculations to generate results ✓
E1c. Provide a simple explanation for those results.	E[2d]/E3d. Present appropriate explanations using numbers, measures, simple diagrams, [simple] charts and symbols appropriate to Entry Level 2./ E3	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		

Problem type:	<sup>1</sup> Simple problem	<sup>2</sup> Straightforward	<sup>3</sup> Complex
<b>Level:</b>	All levels	L1 and L2	Level 2 only
<b>Draws upon knowledge or skills from:</b>	One MCA only	One MCA or a combination of any two MCA	Up to a combination of any three MCA
<b>Number of steps or processes</b>	1	More than 1	At least 2
<b>Context</b>	Familiar to all and easily described	Less familiar – requires some comprehension	Less familiar – requires interpretation and analysis

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

## Background

This resource covers all the Functional Skills content descriptors relating to ratio and proportion. It was written with mixed L1-L2 classes in mind. I wanted to experiment with inverse proportion questions (a new topic in Reformed Functional Maths) but wanted to build up to them gradually. The questions are contextualised and problem based, with no underpinning taught, so learners will need an introduction to ratios (or a refresher) first.

In order to upload this on Shrove Tuesday 2020, I wrote in great haste so there may be errors – especially in the answer sheet. Feedback on content and question styles is welcomed but please do not report answer sheet errors unless you also have a resource of your own that you would like to share. Thank you for your support of skillsworkshop

*Maggie Harnew, Feb 25<sup>th</sup> 2020.*

## Answers

There are many ways of working out (**wo**) proportion problems. Accept any valid method.

**Unless otherwise stated award:** 1 mark for a valid process (even if the final answer incorrect) and 1 mark for correct answer (**ca**). Max marks = 50. Suggested ‘pass’ marks: L1 (18), L2 (35).

1. 2 eggs make 6 pancakes so:

$$\div 2 \quad \begin{array}{c} \curvearrowright \\ \curvearrowright \end{array} \quad \div 2$$

1 egg makes **3 pancakes**

2. 90 ml makes 6 pancakes so:

$$\div 3 \quad \begin{array}{c} \curvearrowright \\ \curvearrowright \end{array} \quad \div 3$$

**30ml** makes 2 pancakes

3. a. 2 litres = 2000ml (1 mark). 2000 ml makes 100 pancakes so 1000ml makes 50 and 500ml makes 25. 50 + 25 = **75 pancakes (or 3 x 25 = 75)**.

b. acceptable reverse calculation e.g. **75/3 = 25**. **Part A - 8 marks**

4. Minimum of one set wo per ingredient (4). 1 mark per answer (10).

	30	3	12
Flour	<b>450g</b>	<b>45g</b>	<b>180g</b>
Salt	<b>10g (2tsp)</b>	1g	<b>4g</b>
Milk	<b>1350ml</b>	<b>135ml</b>	<b>540ml</b>
Oil	<b>10tbs (150ml)</b>	<b>1 tbs (15ml)</b>	4 tbs

**Part B – 14 marks**

5. a. **1:3** (no wo required)

b. **6:2:1** (1 wo, 1 ca)

c. **1:2** (1 wo, 1 ca)

6. a. **3:8** (1 wo, 1 for correct but unsimplified or partially simplified answer) or 2 for fully correct answer)

b. **3:200**

7. a. **55g** cocoa powder

b. **165g** sugar

**Part C – 15 marks**

8. a. 30 minutes (half an hour)

b. 3 hours (5 chefs 200 per hour)

9. lunchtime is 4hrs (11am-3pm) 1 480 / 4 = 120 per hour = 3 chefs

10. dinner session is 3.5 hours (6pm - 9.30pm) 1. 4 chefs = 160 pancakes per hour. 160 x 3.5 = 560 pancakes

**Part D - 13 marks** (allow 2 marks per correct answer for Q8b, 9, 10)

An **editable Word version** of this resource is available, on a one to one exchange basis for your own resource contribution. If you wish to become a registered contributor, please contact Maggie using the site contact link. Thank you. 😊