

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**LEVEL 2 FUNCTIONAL SKILLS MATHEMATICS**

**09866**

**TASK AND ANSWER BOOKLET PRACTICE PAPER 1**

**TIME: 1 HOUR 30 MINUTES**

**INSTRUCTIONS**

Fill in all the boxes below. Make sure your personal details are entered correctly. Use **BLOCK LETTERS**.

Your surname or family name

Your first forename (if any)

Your second forename (if any)

Date of birth

Centre name

Centre number

Your OCR candidate number

At the beginning of this booklet you will find tear off Resource Documents. You will need to refer to these documents to complete the tasks.

You will also need:

- a pen with black ink
- a calculator
- a ruler

**YOU HAVE 1 HOUR AND 30 MINUTES TO COMPLETE THE THREE TASKS**

For each task, make sure that you:

- read the questions carefully before starting
- write your answers in this booklet
- clearly show how your working leads to your answers

**2 marks are available in each task when you show you have checked your work.**

When you have finished, hand this booklet and all the Resource Documents to the supervisor.

Ofqual Qualification Reference Number: 500/8910/9

FOR EXAMINER USE ONLY		
Question No	Mark	Total
<b>TASK A</b>		
1	/6	<b>/20</b>
2	/8	
3	/6	
<b>TASK B</b>		
1	/2	<b>/20</b>
2	/6	
3	/5	
4	/7	
<b>TASK C</b>		
1	/5	<b>/20</b>
2	/8	
3	/7	
<b>Total</b>	<b>/60</b>	

**This document consists of 28 pages. Any blank pages are indicated.**

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## RESOURCE DOCUMENTS

The Resource Documents on pages 5, 7, 9 and 11 contain information to help you to answer the tasks in this booklet.

- The resource documents are perforated along the left hand side, so they can be removed from the task and answer booklet.
- Your supervisor will instruct you when to remove the resource documents, before you start the assessment.
- Please fold pages 5, 7, 9 and 11 along the perforated strip before removing from the task and answer booklet.

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**TASK A – DIY SLIME****RESOURCE DOCUMENT 1****How to make your own *Slime*****Materials:**

- Cornflour
- Water
- Food colouring
- Large bowl and spoon

**What to do**

Put the cornflour into the large bowl.

Mix in water to the cornflour.

*The ratio of cornflour to water by volume should be 2 : 1 so to make 3 cups of Slime you need to mix 2 cups of cornflour with 1 cup of water.*

If you want coloured *Slime* add some food colouring to your water.

Use 5 drops of food colouring per litre of *Slime*.

**Remember**

a litre is 1000 ml

a drop is about 0.05 ml

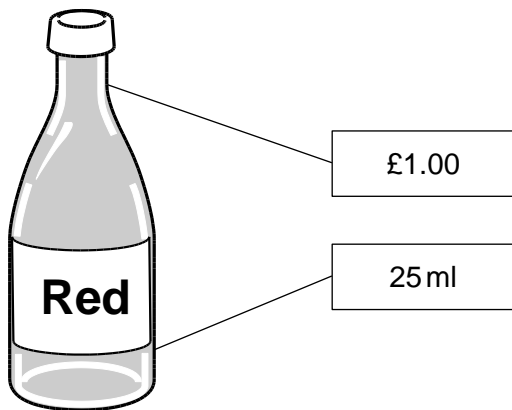
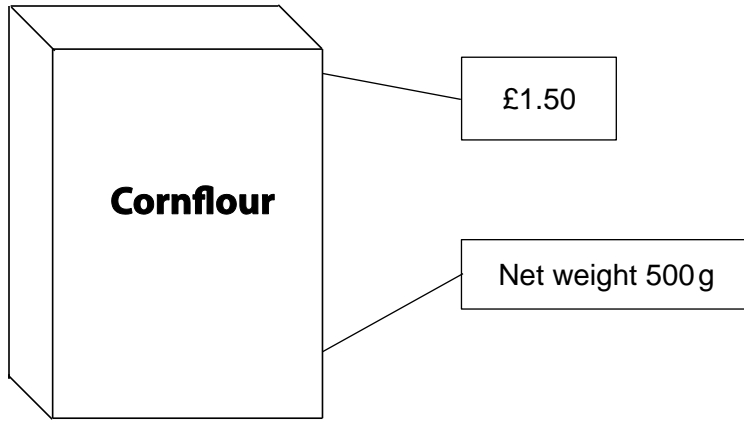
1 ml of cornflour weighs 0.5 g

1 g of cornflour has a volume of 2 ml

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**TASK A – DIY SLIME**

**RESOURCE DOCUMENT 2**



Food colouring  
All colours are the same price

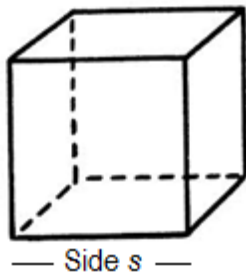
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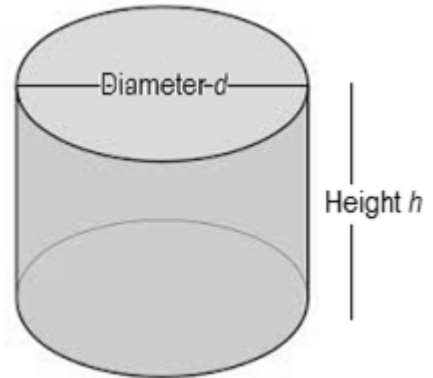
**TASK B – CANDLES****RESOURCE DOCUMENT 1**

Approximate volumes ( $V$ ) of some solids

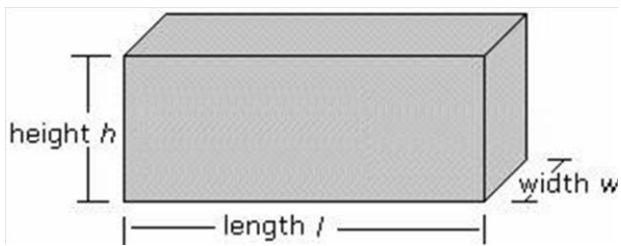
**Cube**  
 $V = s^3$



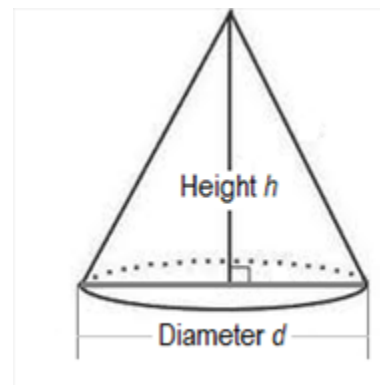
**Cylinder**  
 $V = 0.8d^2h$



**Cuboid**  
 $V = lwh$



**Cone**  
 $V = 0.3d^2h$



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**TASK C – CHIPS****RESOURCE DOCUMENT 1****Nutritional Profile: Chips, as sold in fish and chip shops, average values, per 100g**

Calories (kcal):	239.0
Protein (g):	3.2
Carbohydrate (g):	30.5
Total fat (g):	12.4
Saturated fat (g):	1.1
Fibre (g):	2.2

Ideally food should be low in saturated fat, calories and carbohydrate but high in protein and fibre.

According to *NHS Choices*

- The average man should eat no more than 30 g of **saturated fat** a day.
- The average woman should eat no more than 20 g of **saturated fat** a day.

An adult needs about 50 g of protein a day

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**TASK AND ANSWER PAGES**

Do not turn over this page until you are told to do so by your supervisor.

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**TASK A – DIY SLIME**

You will need Task A Resource Documents 1 and 2.

Roger works at a pre-school unit.  
One of Roger's jobs is to order *Slime*.  
*Slime* is a soft sticky substance that children play with.

On average the unit has 20 children each day.  
The unit is open 5 days a week for 50 weeks a year.

Each child playing with *Slime* needs about 1 litre of *Slime*.  
About a quarter of the children play with *Slime* at any one time.

**Q1 (a)** How much *Slime* is needed at any one time?

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**(2 marks)**

A 500 ml tub of *Slime* costs £2.60.  
It is thrown away after two months.

**(b)** How much does the unit spend on *Slime* in a year?  
Show all your working and any assumptions you make.

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**(4 marks)**

Examiner  
use only  
(Q1)

**[Turn over**

Roger decides to make his own *Slime*.  
He finds a recipe for *Slime* on the internet.

**Q2 (a)** How much will the food colouring cost for one litre of *Slime*?  
Show your working and any assumptions you make.

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**(4 marks)**

**(b)** How much will the cornflour cost to make one litre of *Slime*?

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**(4 marks)**

Examiner  
use only  
(Q2)



**Q3** In one year, can Roger save money by making the *Slime* himself?  
Show your calculations.

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**(4 marks)**

Examiner  
use only  
(Q3)

**Checking (2 marks)**

Examiner  
use only  
(Checking)

**Total marks**

Examiner  
use only  
(Total)

**END OF TASK A**

**[Turn over**

**TASK B – CANDLES**

**You will need Task B Resource Document 1.**

Amy makes candles to sell at craft fairs.

First she melts slabs of wax.



She pours the wax into candle moulds which have wicks in.



When the wax has cooled down the candles are ready.



The wax slabs are cuboids measuring 22 cm by 15 cm by 6 cm.

**Q1** What is the volume of one wax slab?

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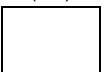
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**(2 marks)**

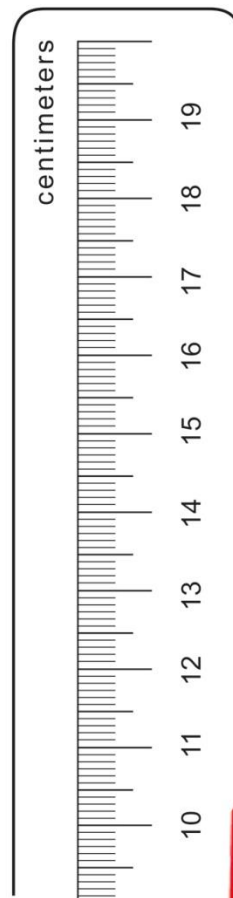
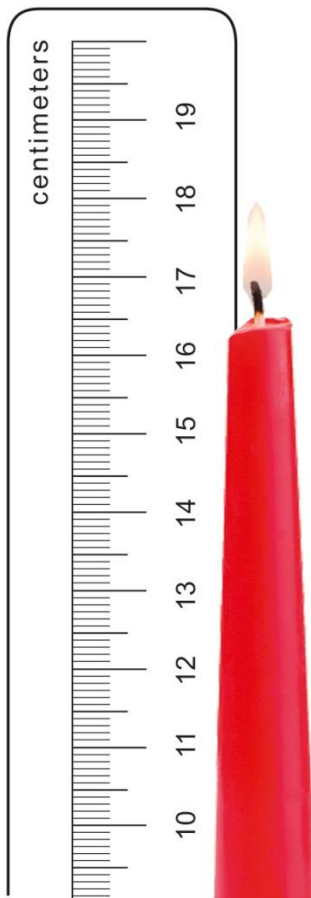
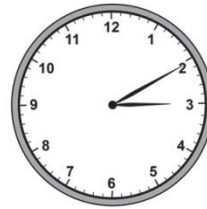
Examiner  
use only  
(Q1)





Most customers want to know how long their candles will burn for.  
Amy always burns a new type of candle to find this out.

These pictures show the height of one of Amy's candles at two different times on one day.





Amy thinks candles give out less  $\text{CO}_2$  than light bulbs.  
This would mean that candles are better for the environment.  
She does some research.



An average electric light bulb produces 45 g of  $\text{CO}_2$  an hour.  
It gives out 600 lumens of light.  
Lumens are a measure of the amount of light given out.

A typical candle lasts 4 hours and produces a total of only 44 g of  $\text{CO}_2$ .  
It gives out about 15 lumens of light.

**Q4** Calculate the amount of  $\text{CO}_2$  produced by candles giving the same amount of light as an electric light bulb. Is Amy right?

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**(5 marks)** Examiner  
use only  
(Q4)

**Checking (2 marks)** Examiner  
use only  
(Checking)

**Total marks** Examiner  
use only  
(Total)

**END OF TASK B**

**TASK C – CHIPS****You will need Task C Resource Document 1.**

Jan eats chips from the local fish and chip shop at least twice a week.  
His partner Pat thinks this is unhealthy. He finds some information in a book.

**Q1** A single portion of chips from their local fish and chip shop weighs about 300 g.

**(a)** How much saturated fat is there in a single portion?

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**(2 marks)**

**(b)** Jan says that eating a 300 g portion of chips gives him almost 20% of the daily protein he needs.  
Is he correct? Support your answer with working.

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**(3 marks)** Examiner  
use only  
(Q1)





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**(8 marks)** Examiner  
use only  
(Q2)

Jan reads this on the *Fish Fryers* website:

**Fact**

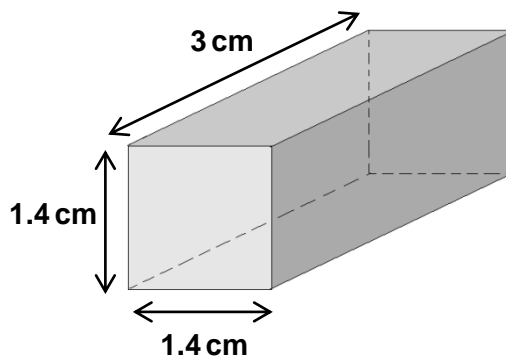
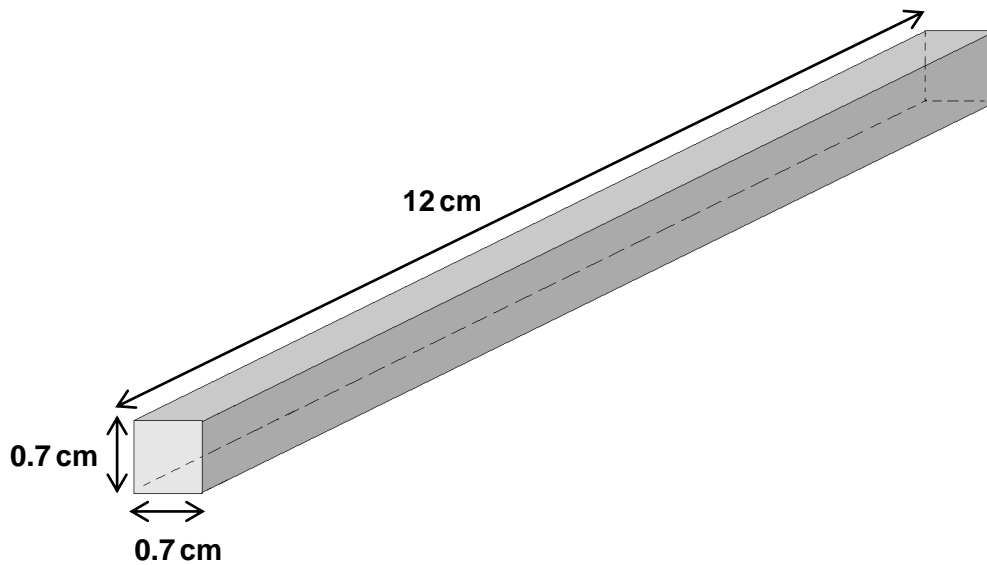
The greater the surface area of a chip the more saturated fat it contains after frying.

When Jan reads this fact he thinks that French fries must have more saturated fat in them than chunky chips.

He assumes that both chip shapes are cuboids.

He sketches the two chip shapes and their dimensions.

Both chips have the same weight and volume.







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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**LEVEL 1 FUNCTIONAL SKILLS MATHEMATICS**

**PRACTICE PAPER 2**

**Mark Scheme**

The maximum mark is 60

## OCR Level 2 Functional Skills Maths Referencing for Coverage and Range

Our ref	Coverage and Range
N1	understand and use positive and negative numbers of any size in practical contexts
N2	carry out calculations with numbers of any size in practical contexts, to a given number of decimal places
N3	understand, use and calculate ratio and proportion, including problems involving scale
N4	understand and use equivalences between fractions, decimals and percentages
A1	understand and use simple formulae and equations involving one- or two-step operations
G1	recognise and use 2D representations of 3D objects
G2	find area, perimeter and volume of common shapes
G3	use, convert and calculate using metric and, where appropriate, imperial measures
S1	collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate
S2	use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using information and communication technology (ICT) where appropriate
S3	use statistical methods to investigate situations
S4	use probability to assess the likelihood of an outcome

N – Number  
 A – Algebra  
 G – Geometry  
 S – Statistics

<b>Representing</b>	<b>Our Ref</b>
Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.	R1
Identify the situation or problems and identify the mathematical methods needed to solve them.	R2
Choose from a range of mathematics to find solutions.	R3
<b>Analysing</b>	
Apply a range of mathematics to find solutions.	A1
Use appropriate checking procedures and evaluate their effectiveness at each stage.	A2
<b>Interpreting</b>	
Interpret and communicate solutions to multistage practical problems in familiar and unfamiliar contexts and situations.	I1
Draw conclusions and provide mathematical justifications	I2

FS Maths Marking Guidance

TASK A – DIY slime

Part	Process	Award	On evidence of....		Exemplification Notes	R	A	I	Coverage/range
Q1(a)*	Calculating slime needed at any one time <b>[A]</b>	2	2	5 (litres/l) _____ or _____		R1 R2			N1
			1	20 ÷ 4 seen or figs 5					
Q1(b)*	Calculating total annual spend on slime <b>[B]</b>	4	4	(£)156 to (£)182 as answer with working _____ or _____		R3	A1 A1	I1	N2 G3
			3	156 to 182 with no working _____ or _____ (Years ÷ weeks lifetime approach) 1 for each correct [operation] seen or implied, up to a <b>maximum of 3</b> [50÷8 or (6 to 7)]					
			3	[×5 or (30 to 35)] [×2] [×2.60 or 260] _____ or _____ (Days open ÷ days lifetime (40)) 1 for each correct [operation] seen or implied, up to a <b>maximum of 3</b> [50×5 or (250)] (days open)					
			3	[÷40 or (6 to 7)] [×2] [×2.60 or 260] _____ or _____ More direct approach of stating that 6 changes a year are needed up to a <b>maximum of 3</b> x6 or 6 x [×2] ["5"] [×2.60 or 260]					

Part	Process	Award	On evidence of....		Exemplification Notes	R	A	I	Coverage/range
Q2(a)*	Calculating cost to colour a litre of slime with food colouring	4	4	1p or £0.01 _____ or _____ 3 Figs 1 as answer _____ or _____ 3 1 for each correct [seen] or implied within a calculation [5 x 0.05] or [0.05 x 5] or [0.25] [÷25] [x 100] or [x1] (if clear intent to do this)		R3 R2	A1	I1	G3 N3 N2
Q2(b)	Calculating cost of corn flour to make a litre of slime.	4	4	(0.99 to 1.01) or (99 to 101) _____ or _____ 1 for each correct [operation] seen or implied within a calculation, up to a maximum of 3 [ $\frac{2}{3} \times 1000$ or $\frac{2}{3} \times$ or $667/666 \times$ ] [x0.5 or ÷2] [x1.5] [÷500]	Last 2 may be evidenced by 0.3 and 0.003 seen at appropriate point in the calculation	R3	A1	I1 I1	S1 G3 N3
Q3	Calculating annual saving	4	3	(£)125.70 or (£)125.76 _____ or _____ 1 "Annual spend on <i>Slime</i> " seen (156 – 182) 1 "Food colouring cost" + "Cornflour cost" (100 to 102 or £ eq.) 1 [x "30" to "35"] _____ and _____ 1 Correct comment about loss or saving based on candidates' figures as shown in this part question	Accept rounding to nearest £1  Correct total cost of making a litre of slime is £1.00 to £1.01 to gain full credit must be evidence of adding on the "1p" for the colouring or a clear statement to ignore it.	R2	A1	I1 I2	N2 N1



Part	Process	Award	On evidence of....	Exemplification Notes	R	A	I	Coverage/range
	Checking	2	<p><b>2:</b> Clear evidence of a checking procedure being carried out at any appropriate point in the task that isn't simply a reverse calculation or. Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected</p> <p><b>1:</b> checking by reverse calculation or at least 3 correct and appropriate calculations seen or implied.</p> <p><b>0:</b> No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence</p>			A2  A2		N1
	<b>TOTAL</b>	<b>20</b>	<b>3*</b>		<b>7</b>	<b>7</b>	<b>6</b>	

\* fixed response marks

Process	R	A	I	Coverage	N1	N2	N3	N4	A1	G1	G2	G3	S1	S2	S3	S4
Q1a	2				2											
Q1b	1	2	1			3						1				
Q2a	2	1	1		2	1						1				
Q2b	1	1	2				2					1	1			
Q3	1	3	2		3	3										
<b>Total</b>	<b>8</b>	<b>7</b>	<b>6</b>		<b>7</b>	<b>7</b>	<b>2</b>					<b>3</b>	<b>1</b>			

## FS Maths Marking Guidance

### TASK B – Candles

Part	Process	Award	On evidence of		Exemplification Notes	R	A	I	Coverage/range
Q1*	Calculating the volume of a wax slab. [A]	2	2	1980 (cm <sup>3</sup> ) _____ or _____		R1 R1			G2
				22 × 15 × 6 seen					
				Some candidates may change to Imperial for the comparison					
Q2*	Changing dimensions of mould into centimetres [B]	2	2	Either conversion correct i.e. 7.7 or 13.75 seen _____ or _____	Some candidates may change to Imperial for the comparison 1980 (cm <sup>3</sup> ) = 126.72 (inches <sup>3</sup> )	R2 R2	A1 A1 A1	I1	N3 G3 G2 N2
	Calculating volume of the new candle [C]	2	2	618.(75) _____ or _____					
			1	At least two of [these] seen [0.8] [ × “7.5 <sup>2</sup> ” ] [ × 13.75 ]					
	Calculating number of candles which can be made from a single slab [D]	2	2	3 (candles) _____ or _____					
			1	3.2 or 4 (rounded up from 3.2) _____ or _____					
			2	“1980” ÷ “618.75” rounded down _____ or _____					
			1	“1980” ÷ “618.75” given as a decimal answer or rounded up					
				There may be alternative methods seen such as “informal” direct proportion					
Q3**	Finding length of candle burnt [E]	2	2	6 ± 0.2 (cm) _____ or _____		R2 R3		I1 I1 I1	G3 N3
			1	16.5 ± 0.1 or 10.5 ± 0.1 seen _____ or _____					
			1	12.2 ± 0.1 and 18.1 ± 1 seen					

Part	Process	Award	On evidence of		Exemplification Notes	R	A	I	Coverage/range
	Length of time candle burnt for <b>[F]</b>	1	1	4 (hours) seen in working					
	Calculating burn rate <b>[G]</b>	1	1	"6 (cm)" ÷ "4" seen (1.5(hr))					
	Using burn rate to calculate burn time for candle <b>[H]</b>	1	1	30 ÷ "burn rate" (20 (hours))					
<b>Q4*</b>	Calculating number of candles to give 600 lumens <b>[I]</b>	2	2	40 (candles) _____ or _____ Division by 15 seen in working.		<b>R3</b>	<b>A1</b> <b>A1</b> <b>A2</b> <b>A2</b>	<b>I1</b> <b>I1</b>	
	Hourly rate of CO <sub>2</sub> production by a candle <b>[J]</b>	1	1	44 ÷ 4 (=11) or equivalent _____ or _____ 44 x 40 (=1760)					
	Calculating the CO <sub>2</sub> footprint of the above number of candles <b>[K]</b>	1	1	"number of candles" × "11" (440 (g of CO <sub>2</sub> )) _____ or _____ 45 x 4 (=180)	Common error here will probably be to omit to divide by 4 hours and so working through with 44 of CO <sub>2</sub>				
	Finding if Amy is right by comparing CO <sub>2</sub> figures. <b>[L]</b>	1	1	Consistent observation from candidates' results					

Part	Process	Award	On evidence of	Exemplification Notes	R	A	I	Coverage/range
	<b>Checking</b> <b>[CH]</b>	<b>2</b>	<b>2:</b> Clear evidence of a checking procedure being carried out at any appropriate point in the task that isn't simply a reverse calculation <b>or.</b> Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected  <b>1:</b> checking by reverse calculation or at least 3 correct and appropriate calculations seen or implied.  <b>0:</b> No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence					
	<b>TOTAL</b>	<b>20</b>	<b>5*</b>		<b>7</b>	<b>7</b>	<b>6</b>	

\* fixed response marks

Process	R	A	I	Coverage	N1	N2	N3	N4	A1	G1	G2	G3	S1	S2	S3	S4
<b>1</b>	2										2					
<b>2</b>	2	3	1		1		2				2	1				
<b>3</b>	2		3				3					2				
<b>4</b>	1	4	2		3	2	2									
<b>Total</b>	7	7	6		4	2	7				4	3				

FS Maths Marking Guidance

TASK C – Chips

Part	Process	Award			Exemplification Notes	R	A	I	Coverage/range
		On evidence of							
Q1(a) *	Calculating the weight of saturated fat in 300 g portion of chips <b>[A]</b>	2	2 1	3.3 (g) _____ or _____ 1.1 or ×3 seen in working		R1 R2			N1 S1
Q1(b) **	Calculating protein in a portion of chip shop chips <b>[B]</b>	1	1	9.6 (g) (may be embedded)		R2	A1	I1	N4 N1 S1
	Finding 20% of 50 g _____ or _____  Finding 9.6 as a % of 50 <b>[C]</b>	1	1	10(g)  _____ or _____  $\frac{9.6}{50}$ or 19.2 (%)	$\frac{9.6}{50}$ alone gains the mark, condone 19%				
	Reflecting on Pat’s statement (chips provide 20% of daily protein) <b>[D]</b>	1	1	Correct comparison of two above figures calculated by the candidate.	Observation without specific mention of “numbers” is sufficient providing these are visible in the working. Allow “not quite” or similar comment.				
Q2	Calculating appropriate summary measure (mean / median) <b>[E]</b>	3	2 1 1 1 1	First correct mean / median Second correct mean / median _____ or _____ 12.8 or 9.6 seen in working [÷ 8] and [÷ 6] seen in working _____ or _____ 1 Attempt to order one of the lists	Oven= Microwave= 1.6 / 1.5 1.6 / 1.5	R2 R2	A1 A1 A1	I1 I1 I1	S2 S3



Part	Process	Award On evidence of		Exemplification Notes	R	A	I	Coverage/range
	Checking [CH]	2	<p><b>2:</b> Clear evidence of a checking procedure being carried out at any appropriate point in the task that isn't simply a reverse calculation or. Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected</p> <p><b>1:</b> checking by reverse calculation or at least 3 correct and appropriate calculations seen or implied.</p> <p><b>0:</b> No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence</p>					
	<b>TOTAL</b>	<b>20</b>	<b>3*</b>		<b>7</b>	<b>7</b>	<b>6</b>	

\* fixed response marks

Process	R	A	I	Coverage	N1	N2	N3	N4	A1	G1	G2	G3	S1	S2	S3	S4
1a	2				1								1			
1b	1	1	1		1			1					1			
Q2	2	3	3			1								5	2	
Q3	2	3	2		1	1					5					
<b>Total</b>	<b>7</b>	<b>7</b>	<b>6</b>		<b>3</b>	<b>2</b>		<b>1</b>			<b>5</b>		<b>2</b>	<b>5</b>	<b>2</b>	