# GCSE MARKING SCHEME

**SUMMER 2022**

**GCSE**
**MATHEMATICS – NUMERACY**
**UNIT 2 – FOUNDATION TIER**
**3310U20-1**

## INTRODUCTION

This marking scheme was used by WJEC for the 2022 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

**WJEC GCSE MATHEMATICS - NUMERACY**

**SUMMER 2022 MARKING SCHEME**

| **Unit 2: Foundation Tier** | Mark | Comments |
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| 1(a) (£)9.30 ÷ 5<br>(£)1.86 or 186(p) | M1<br>A1 | Sight of the digits 186 gains M1<br>If units are given they must be correct |
| 1(b) ((£)13.80 – (£)9.30) ÷ 2<br>(£)2.25 or 225 (p) | M1<br>A1 | Sight of the digits 225 gains M1<br>FT use of 5 × 'their (£)1.86' stated in (a) instead of (£)9.30<br>If units are given they must be correct |
| 2(a) 6 (˚C) | B1 | Accept -6 (˚C)<br>Answer may be embedded within a sentence |
| 2(b) 4-star | B1 | |
| 2(c) **No** and suitable reason given relating to time of 3 star and 4 star freezers being different e.g.<br><br>'For 6 months, she needs a 4-star freezer'.<br>'because the 4 star means you can store food for longer (than 3 months)'<br>'because June to December is more than 3 months'<br>'because 3 stars is not long enough'<br>'need longer than 3 months'<br>'needs 3 months or longer'<br>'need from June to December which is 6 months'<br>'because the food won't last until December' | E1 | Allow:<br>'No because from June to December is 7 months'<br>'No because from June to December is 5 months'<br><br>Do not allow:<br>'No, because they are the same temperature'<br>'No because June to December is 4 months' i.e., reference to the incorrect number of months.<br>'No because the food will go off and you will have to throw it away' |
| 3(a) Cuddly toy | B1 | Allow cuddly toy and 12 given together<br>B0 for 12 alone |
| 3(b) **No** and reason given e.g.<br><br>'The frequencies would all need to be the same for an equal chance'<br>'no as it seems that there are more cuddly toys than anything else'<br>'There aren't equal numbers of each prize'<br>'more of some prizes than others'<br>'numbers are not equal'<br>'different number of prizes'<br>'not equal to each other'<br>'different amounts of different prizes'<br>'cuddly toy is most common'<br>'more of one thing than another'<br>'more likely to win a cuddly toy or box of chocolates'<br>'less chance to win a book or photo frame'<br>'less of certain prizes' | E1 | Ignore additional spurious or incorrect statements for accepted and allowed responses<br><br>Allow<br>'different amounts available'<br>'different amount of stock for the prizes'<br>'there's only 5 books, 9 boxes of chocolates and there are 12 cuddly toys'<br>'there's 12 cuddly toys and 2 photo frames'<br>(comparison of any 2 or more)<br>'more prizes than others'<br><br>Do not allow<br>'there are only 2 photo frames' (with nothing else said – no comparison with any other prize)<br>'different prizes' |

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| 3(c) (Cost of prizes without discount)<br>$9 \times 1.80 + 12 \times 2.30 + 5 \times 3.20 + 2 \times 4.70$<br>(16.20 + 27.60 + 16 + 9.40) | M2 | May be seen in stages<br>Award M1 for:<br>• the sum of 3 correct products<br>• sight of all 4 correct products (even if not added) |
| (£)69.2(0) | A1 | CAO |
| (Discount) (£)6.92 | B1 | Allow (£)6.9(0) if 6.92 seen<br>FT 10% of 'their (£)69.2(0)' including 10% of (£)12<br>This may be implied in their final answer. |
| (Cost of prizes with discount) (£)69.2(0) – (£)6.92 | M1 | FT 'their (£)69.2(0)' – 'their (£)6.92' provided there has been an attempt at finding 10% and 10 or 0.10 is not used as their value of 10% |
| (£)62.28 | A1 | |
| *3(c) Alternative method 1*<br>*(10% discount for each prize) (£)0.18 or (£)0.23 or (£)0.32 or (£)0.47* | *B1* | *Accept 18(p) or 23(p) or 32(p) or 47(p).*<br>*If units stated, they must be correct* |
| *Correct cost of all reductions 1.62 AND 2.07 AND 2.88 AND 4.23* | *B2* | *Award B1 for any one correct reduction* |
| *9 × 1.62 + 12 × 2.07 + 5 × 2.88 + 2 × 4.23*<br>*(£14.58 + £24.84 + £14.40 + £8.46)* | *M2* | *FT from B1, B1*<br>*Award M1 for the sum of 3 correct products* |
| *(£)62.28* | *A1* | |
| *3(c) Alternative method 2*<br>*(10% discount for each prize) (£)0.18 or (£)0.23 or (£)0.32 or (£)0.47* | *B1* | *Accept 18(p) or 23(p) or 32(p) or 47(p).*<br>*If units stated, they must be correct* |
| *(Total discount)*<br>*9×(£)0.18 + 12×(£)0.23 + 5×(£)0.32 + 2×(£)0.47*<br>*(£1.62 + £2.76 + £1.60 + £0.94)* | *M2* | *FT 'their (£)0.18 or (£)0.23 or (£)0.32 or (£)0.47'*<br>*Award M1 for the sum of 3 correct products* |
| *(Total discount) (£)6.92* | *A1* | *CAO* |
| *(Cost of prizes with discount) (£)69.2(0) – (£)6.92*<br>*(£)62.28* | *M1*<br>*A1* | *FT 'their (£)69.2(0)' – 'their (£)6.92* |
| Organisation and communication | OC1 | For OC1, candidates will be expected to:<br>• present their response in a structured way<br>• explain to the reader what they are doing at each step of their response<br>• lay out their explanations and working in a way that is clear and logical<br>• write a conclusion that draws together their results and explains what their answer means |
| Writing | W1 | For W1, candidates will be expected to:<br>• show all their working<br>• make few, if any, errors in spelling, punctuation and grammar<br>• use correct mathematical form in their working<br>• use appropriate terminology, units, etc. |

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| 4. Evidence of counting squares<br>Number of squares 11 – 16 (squares or $cm^2$)<br><br>(Area = 'Their number of squares' × 0·5 $m^2$ =)<br>5.5 – 8 ($m^2$)<br><br>(Cost of glass=) 'their area' × (£)290<br><br>Correct answer | M1<br>A1<br><br>B1<br><br>M1<br><br>A1 | Look at diagram<br>If 'their number of squares' is within the range and no evidence of counting squares award M1 A1<br>If count squares of whole grid (70) then M0A0. FT with this<br><br>FT 'Their number of squares' × 0·5 ($m^2$)<br>or 'Their number of squares' ÷ 2 ($m^2$)<br>This B1 may be seen at the end eg 12 × 290 ÷ 2<br><br>Award M1A1B1 when no evidence of number of squares counted and a value between 5.5 and 8 is multiplied by 290. This would then get final M1 and a possible A1<br><br>FT 'their area' × (£)290 provided M1 or B1 previously awarded<br>Allow rounded value of (£)300 used for (£)290<br><br>Note: check if 290 has been ÷ 2 rather than number of squares ÷ 2<br>Check 145 × number of squares |
| 5.<br>Showing (47%), **<u>20%,</u>** (5%), **<u>3%</u>** and **<u>25%</u>**<br><br>OR **<u>0·47</u>**, (0·2), **<u>0·05</u>**, (0·03) and **<u>0·25</u>**<br><br>OR 47/100, 20/100, 5/100, 3/100 and 25/100<br><br>OR five correct calculations for a common amount<br><br>**Largest** ↓ **Smallest**<br>**Ocean**<br>**Pacific (47%)**<br>Atlantic (¼)<br>Indian (0.2)<br>Southern (5%)<br>Arctic (0.03) | B2<br><br>B1 | Look at the given table for some equivalent values<br>B2 for all correct %<br>OR all correct decimals<br>OR all correct fractions <u>with a common denominator</u><br>OR correct work using a common amount<br>OR a valid combination that allows full comparison<br><br>Award B1 for any 2 correct conversions<br><br>Allow any unambiguous indication (e.g. 'converted values').<br>**Strict FT** of 'their work' if at least B1 gained.<br><br>Correct answer (either oceans or proportions) with <u>no</u> other marks awarded, gains final B1. |

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| 6(a).<br>$(5 \times 30 + 4) \times 4$ or $20 \times 30 + 4 \times 4$<br>$(154 \times 4)$ or $(600 + 16)$ | M2 | Look at diagram<br>May be seen in stages<br>Award M1 for sight of:<br>• $(5 \times 30) \times 4$ (=600)<br>• $5 \times 30 + 4$ (=154)<br>• $(5 \times 30) \times 4$ + multiple 4 (≤ 20) |
| 616 (cm) | A1 | FT for 'their perimeter' provided at least M1 awarded AND 4 sides considered<br>• 600<br>• 600 + multiple 4 (≤ 20) correctly evaluated<br><br>Eg $(5 \times 30) \times 4 = 600$ gains M1 A1 |
| 6·16 (metres) | A1 | FT 'their perimeter' for correct conversion to metres provided at least M1 awarded<br><br>Eg A final answer of 6(m) gains M1 A1 A1<br><br>If no marks awarded, award SC1 for sight of<br>• 16(cm) or 0.16(m)<br>• 150(cm) or 1.5(m) |
| 6(b) $1{\cdot}3 \times 0{\cdot}4$ or $130 \times 40$ | M1 | Must be only the correct method but allow if x/÷ by power of 10 |
| 0·52 or 5200 | A1 | Mark final answer<br>Allow 0·5 provided no incorrect working seen |
| $m^2$ or $cm^2$ | U1 | Correct units for 'their area'<br><br>Eg $1.3 \times 0{\cdot}4 = 0.52$<br>$0.52 \times 100 = 52\ cm^2$<br>Award M1 A0 U1 (attempt to change to $cm^2$) |
| 7(a) 1 (km) | B1 | |
| 7(b) 7½ hours | B1 | |
| 7(c) 5 (km) | B1 | |
| 8(a) (Breakfast recommendation is) $0.35 \times 2400$<br>or $240 + 240 + 240 + ½$ of 240<br>or $2400 - 0.65 \times 2400$ or equivalent | M1 | (= 840) May be seen in stages<br>35% of 2400 without further working is awarded M0<br>Sight of 240 + 240 + 240 + 24 is awarded M0 |
| (Difference in calories) $860 - 0.35 \times 2400$ | M1 | Allow $0.35 \times 2400 - 860$ for M1<br>FT 860 – 'their derived 840' irrespective of how 'their 840' was derived |
| 20 (calories) | A1 | CAO. Answer of -20 (calories) is A0<br>Allow incorrect units seen, e.g. 20% |
| *8(a) <u>Alternative method</u>*<br>*(Difference in calories) (860 ÷ 2400 – 0.35) × 2400*<br>*20 (calories)* | *M2*<br>*A1* | *M1 for 860 ÷ 2400 – 0.35*<br>*CAO. Allow incorrect units seen, e.g. 20%* |
| 8(b) 23 : 5 | B1 | Must be whole numbers, mark final answer<br>Allow 23g : 5g |

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| 9. | | If an answer space blank, check working below the table to mark any unambiguous intention |
| Number of units 520 | B1 | Answer shown in the space in the row with the meter readings takes precedence<br>If the space in the row with meter reading is blank, allow if 520 seen in the charge for electricity row |
| Charge for units 520 × (0.)21 | M1 | FT 'their 520', the number of units used must be given or clear from the units row<br>Award for sight of digits 1092(0) or equivalent on FT |
| (£) 109.2(0) | A1 | Must be in pounds. |
| (Standing charge) (3 months) (£) 21(.00) | B1 | |
| Total charges (£) 130.2(0) | B1 | FT 'their 109.2(0)' + 'their 21(.00)' correctly evaluated, provided neither amount = 0 |
| VAT at 5% (£) 6.51 | B1 | FT 5% of 'their 130.2(0)' correctly evaluated, allow rounding or truncation to a penny (2 d.p.) |
| Amount to pay (£) 136.71 | B1 | CAO |
| 10(a) (Circumference) π × 140 | M1 | Do not accept embedded within an incorrect calculation for the circumference |
| Answer in the range 439 (cm) to 440 (cm) | A1 | May be implied in later working |
| π × 140 – 176 – 128 – 60 or π × 140 – 364 or equivalent | M1 | FT 'their derived circumference' from a calculation involving π (including use of πr or $\pi r^2$), including from previous truncation or rounding errors |
| Answer in the range 75.6 (cm) to 76 (cm) | A1 | CAO, answer must be in the range stated. If no final answer given, check if an answer has been inserted in the statement in the question |
| 10(b) (Area =) ½ × (4.3 + 5.6) × 2.5 or 2.5 × 4.3 + ½ × 2.5 × (5.6 – 4.3) or equivalent | M1 | |
| 12.375 ($m^2$) | A1 | Allow 12.37($m^2$), 12.38($m^2$) or 12.4 ($m^2$) provided not from incorrect working (e.g. 4.3 + 2.5 + 5.6 = 12.4)<br>May be implied in further working |
| (Number of bags) 12.375 ÷ 0.9 or 13.75 | M1 | FT 'their 12.375' including the use of 12.375 rounded or truncated<br>Allow for a trial and improvement method provided the final trial gives 14 bags, e.g. for sight of $0.9 \times 14 = 12.6$ |
| 14 (bags) | A1 | **Must be** rounded up to a whole number of bags<br>Allow for an embedded answer of 14 (e.g. from within a multiplication) |
| (Cost of fertilizer is 14 × £1.15) (£) 16.1(0) | B1 | FT provided a whole number of bags considered and at least 1 mark (M1) previously awarded |

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| 11(a) Every 15 minutes | B1 | |
| 11(b) 14(:)00 or 2 p.m. | B1 | Allow an answer of 2 or 14(:)00p.m.<br>Do not accept an answer of 2 a.m. |
| 11(c) 11 (°C) | B1 | |
| 11(d)(i) 5 points plotted accurately:<br>(12:00, 100), (13:00, 105), (14:00, 110), (15:00, 109), (16:00, 109) | B1 | Plotting of 100 and 110 should be intention of being on the appropriate line<br>Tolerance for plotting 105 and 109 is within the appropriate small square<br>Ignore any joining of plotted points |
| 11(d)(ii) Appropriate reason, e.g.<br>'the rise in temperature doesn't look very much',<br>'it is only temperatures from 100°C that are needed',<br>'not showing the warning light was on as often as it was',<br>'it doesn't show the fluctuating temperature',<br>'doesn't show the number of warnings given (when over 110°C)',<br>'more details are required to show the warnings', | E1 | Ignore additional spurious or incorrect statements for accepted and allowed responses<br><br>Allow, e.g.<br>'misleading' **with** a suitable reason given<br>'doesn't give the same detail (as the first graph)',<br>'doesn't give the details of temperature changes',<br>'it doesn't show all the temperature changes',<br>'doesn't give the same accuracy (as the first graph)',<br>'doesn't give the accurate temperature changes',<br>'only shows specific times',<br>'only recording once an hour',<br>'there is no data to fill the gaps',<br>'the temperatures between are not shown',<br>It doesn't give all the information',<br>'not all the points plotted from the previous graph',<br>'small scale',<br>'the temperature goes up in 2's rather than 0.5',<br>'lost loads of the data',<br>'there are not many points',<br>'it doesn't change much to show when something went wrong',<br>'there are no temperatures recorded below 100°C'<br><br>Do not accept, e.g.<br>'misleading',<br>'not accurate',<br>'it doesn't give the accurate temperatures',<br>'the temperatures aren't the same as the first graph',<br>'most points are not over 110°C',<br>'the temperature goes higher on the axis than the other graph' |