Functional Skills Mathematics

Level 2 Sample Assessment Material (SAMs)

Mark Scheme

Task 1 – Blackpool Tower

Process	Award	on evidence of …	Specification Criteria
[A] Finding true distance from Meols to Blackpool	**1** **2**	Attempts measurement of distance on map - a value recorded measurement of 8 to 9 (cm) or 80 to 90 (mm) seen	Decide on the method/ operation and tools including ICT where appropriate to use in a situation RT
Changes scale into "usable" form	**1** **2**	Attempts to use scale Recognises that 4cm = 20km so 1 cm = 5 km	Decide on the method/ operation and tools including ICT where appropriate to use in a situation RT
Uses scale to convert to km	**1** **2**	For "number" x 5 seen and/or their measurement converted to km Correct answer 40 to 45 (km) seen	Apply appropriate mathematical procedures and strategies to examine patterns and relationships. AT
Evidence of checking distance	**1**	No obvious mistakes in measurement etc – ie measures in cm and converts from cm	
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	2	Appreciation/evidence that distance calculated is reasonable	

[B] Converting height of Tower into metres	**1** **2**	Attempts conversion e.g. 519 x 30 ÷100 seen 155.7m or 156m seen	Identify with the context. Clearly distinguish between irrelevant and relevant information and data. RC
Use of word formula	**1** **2**	Attempts to find square root i.e. $\sqrt{\text{"their height"}}$ seen but not correct $\sqrt{\text{"their height"}}$ correct	Apply appropriate mathematical procedures and strategies to examine patterns and relationships. AT
	1 **2**	Attempts to deal with constants in formula i.e. $\sqrt{\text{"their height"}}$ x 3.5 + 5 51 km (1 for just 51)	Apply appropriate mathematical procedures and strategies to examine patterns and relationships. AT
Evidence of checking	**1** **2**	No obvious mistakes etc – x 3.5 then + 3 Appreciation/evidence that distance calculated is reasonable	Draw conclusions and provide mathematical justifications, and find and check results and conclusions IT
[C] Comparison of their answer with Amy's	**1** **2**	Evidence of checking their answer to [B] – the formula with their answer to [A] – the map distance. Correct statement made consistent with their answers to [A] and [B]	Interpret and communicate solutions to practical problems in familiar and unfamiliar contexts IF
Marks awarded to Task 1	**18**	**R = 6, A = 6, I = 6**	

Task 2 - Solar Panels

Process	Award	on evidence of …	Specification Criteria
Deciding on number of panels (N)	**1** **2**	Dimensioned sketch or (2.5÷1.2/0.6 or 2.0÷1.2/0.6) 6 (panels)	Identify with the context. Clearly distinguish between irrelevant and relevant information and data. RC
Finding hours of sunshine in a year (H)	**1** **2**	Attempts to total monthly sunshine from chart Answer clearly stated of between 1500 hours to 1800 hours.	Interpret and communicate solutions to practical problems in familiar and unfamiliar contexts IF
Finding area (A) of a single panel to find power output single a single panel for each hour of sunshine.	**1** **2**	0.6 x 1.2 (or the digits) 0.72 (m^2)	Apply appropriate mathematical procedures and strategies to examine patterns and relationships. AT
Power output from a single panel	**1** **2**	A x 0.11 seen or implied 0.0792 – allow full follow through if clear.	Decide on the method/operation and tools including ICT where appropriate to use in a situation RT
Finding total power (Punits of electricity) output from N panels four H hours of sunshine a year	**1** **2**	N x A x 0.11 x H 711 to 856 units	Recognise that an unfamiliar situation/practical problem has aspects that can be represented using previously encountered mathematics RF
Calculating the total “income” from the solar power generated	**1** **2**	P x 0.165 seen or implied Correct answer to “P” x 0.165 (i.e. full follow through if clear)	Draw conclusions and provide mathematical justifications, and find and check results and conclusions IT

Finding cost of setting the solar power system up.	**1** **2**	N x 355 + 450 seen or implied Clear attempt to find 70% (directly or indirectly) of the above or clearly stated figure of £1806	Apply appropriate mathematical procedures and strategies to examine patterns and relationships. AT
Checking of results at any point	**1** **2**	No obvious mistakes in arithmetic Appreciation/evidence at any point of numerical checking or some comment to the effect that values are reasonable	Draw conclusions and consider the appropriateness and accuracy of the results and conclusions II
Comparison of inputs (buying the stem) with amount of money saved in terms of "free" electricity.	**1** **2**	Clear attempt to compare "their calculated" figures Comment to effect that over a year there would be a loss of between £1660 and £1690	Interpret and communicate solutions to practical problems in familiar and unfamiliar contexts IF
Marks awarded to Task 2	**18**	**R = 6, A = 4, I = 8**	

Task 3 - Carrying cans

Process	Award	on evidence of …	Specification Criteria
Deciding on total weight of cans to carry comfortably	**1**	Sight of a number (of cans) in range 25 to 100.	Identify with the context. Clearly distinguish between irrelevant and relevant information and data. **RC**
	2	Explicit mention of maximum weight between 10 kg and 40 kg	
Deciding on number of cans in a tray/box	**1**	A weight in range (10 to 50) ÷ (digit 4)	Recognise that an unfamiliar situation/practical problem has aspects that can be represented using previously encountered mathematics **RF**
	2	Weight in range (10 to 40) ÷ (0.4 or 0.5) = *N* (correct)	
Deciding on size of tray/box base (a)	**1**	Attempt (or implied attempt) to find two whole numbers (*m* and *n*) close to *N* ("their" maximum number of cans)	Recognise that an unfamiliar situation/practical problem has aspects that can be represented using previously encountered mathematics **RF**
	2	Correct values of *m* and *n* consistent with "their" *N* – giving a product ≤ *N* (*m* and *n* are the width and lengths of the box/tray in can diameters)	
Deciding on size of tray/box base (b)	**1**	Sight of number(s) x (7.0 to 7.5 or "their" can diameter)	Decide on the method/ operation and tools including ICT where appropriate to use in a situation. **RT**
	2	Correct values of product of "their" *m* and *n* with (7.0 to 7.5)	
Producing scaled plan of cut out (a)	**1**	Sketch of net of a cuboid (with or without a top)	Making and refining a model/models and explain/justify methods chosen. **RI**
	2	Sketch of the net of a cuboid (with or without a top) with some dimensions indicated – some consistent with "their" dimensions (*m* and *n* x (7.0 to 7.5))	

Producing scaled plan of cut out (b)	**1**	Scale plan of net of a cuboid (with or without a top) with scale indicated and at least one dimension consistent with “their” working.	Apply appropriate mathematical procedures and strategies to examine patterns and relationships. **AT**
	2	Correctly drawn scale plan – with scale indicated.	
Producing sketch of completed tray/box	**1**	Sketch a cuboid (with or without a top) roughly to scale based on previous working.	Interpret and communicate solutions to practical problems in familiar and unfamiliar contexts. **IF**
	2	Sketch a cuboid (with or without a top) roughly to scale based on previous working with main dimensions clearly indicated.	
Producing a design fit for purpose	**1**	A broadly practicable design consistent with “their” working and implicit assumptions	Draw conclusions and provide mathematical justifications, and find and check results and conclusions. **IT**
	2	A broadly practicable design consistent with “their” working and implicit assumptions with sensible arrangement of flaps for fixing.	
Checking practically of design	**1**	Any comment about the practically of “their” design not explicitly covered above.	Draw conclusions and consider the appropriateness and accuracy of the results and conclusions. **II**
	1	Any explicit mention or evidence of checking or a clearly good design with no significant errors or flaws.	
Marks awarded to Task 3	**18**	**R = 10, A = 2, I = 6**	