Functional Skills Mathematics
Level 2 assessment

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Version 1.0

Mark scheme

These materials relate to the assessments that will be in use from Autumn 2016

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ONSCREEN
SAMPLE PAPER 1

Level 2 Sample Paper 1

Question	Mark	Represent	Analyse	Interpret	Open	Fixed
S1Q1a	4	3	1	0	4	0
S1Q1b	2	0	0	2	2	0
S1Q2	8	2	2	4	8	0
S1Q3a	6	2	3	1	6	0
S1Q3b	2	1	1	0	2	0
S1Q4	3	0	0	3	3	0
S2Q1a	4	3	1	0	4	0
S2Q1b	2	1	0	1	2	0
S2Q1c	5	2	3	0	5	0
S2Q2	5	2	2	1	5	0
S2Q3a	5	2	3	0	5	0
S2Q3b	4	2	2	0	4	0
S3Q1a	4	1	3	0	4	0
S3Q1b	1	0	0	1	1	0
S3Q2a	3	1	2	0	0	3
S3Q2b	2	1	1	0	2	0
S3Q3	5	0	0	5	5	0
S3Q4	2	0	0	2	2	0
S3Q5a	3	2	0	1	3	0
S3Q5b	4	1	1	2	4	0
S3Q5c	1	0	0	1	1	0
Total	75	26	25	24	72	3
		35%	33%	32%	96%	4%

Guidance Notes for Sample Paper Mark Schemes
Level 1 and Level 2

Notes:

The mark scheme has been carefully constructed to avoid penalising candidates repeatedly for similar errors:

1) Principle of follow through applies throughout unless otherwise stated. This allows the candidates to gain credit for subsequent correct calculation based on a previous incorrect answer.

2) Units or numbers shown in brackets on the mark scheme are not required for the awarding of mark/s on the candidate's paper. However, if a candidate states units they must be correct:

eg 24(cm) means accept 24cm or 24 but not 24m
eg (£)72.5(0) means accept £72.50 or £72.5 or 72.50 or 72.5

3) URT means unrounded, rounded or truncated; the underlining defines the acceptable limit of approximation:

eg 860. *8652* URT (U is the unrounded version)
the following are acceptable: 860 (T) or 861 (R) 860.8 (T) or 860.9 (R) or 860.86 (T) or 860.87 (R) or 860.865 (R) or 860.8652 (U) but not eg 900.

Total marks available: 75

NB incorrect money format given as an answer should only be penalised **once** on the whole paper and will lose 1 mark. Do not penalise any subsequent incorrect format. eg (£)380.7 loses 1 mark in S1Q3a.

Section 1

Question	Total marks	Marks	Marks awarded for
S1Q1a	**4**	**1**	**teams of 5 employees each including at least one manager**
		3	**example**

Team A		Team B	
Abbie	(2)	Alvin	(3)
Isaac	(5)	Lora	(5)
Ash	(5)	Simon	(4)
Nita	(2)	Frank	(2)
Pete	(2)	Prita	(3)
Total fitness score	16	Total fitness score	17

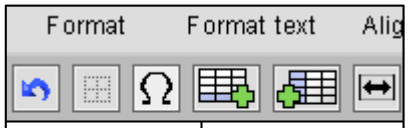
		2	combined level scores of 15 and 18 matching team members' individual scores
		1	correct scores for any one team
S1Q1b	**2**	**2**	**two suitable reasons based on results or data given** **eg 'each team has a manager'** **eg 'the combined (fitness) scores are similar'**
		1	one suitable reason
S1Q2	**8**	*timetable*	
		1	**timetable structure with rows and columns and appropriate delineation showing activities AND times with some headings / labels for times and activities**
		1	**given data ie intro, lunch and prizes clearly shown with times**
		2	**at least three activities entered WITH times**
		1	at least two activities entered WITH times
		choices for activities	
		4	**3 additional activities (=3.5 hours) chosen for the morning session AND 1 additional activity (=1.5 hours) chosen for the afternoon session** **eg assault course, paintball and mountain biking (90+60+60) for the morning AND canoeing (90) for the afternoon** **eg quad biking, windsurfing and paintball (75+75+60) for the morning AND tree climbing (90) for the afternoon** **eg quad biking, zip wire and climbing wall (75+45+90) for the morning AND assault course (90) for the afternoon**
		3	4 additional activities chosen that take 5 hours in total without morning and afternoon sessions identified **or** 4 or 5 additional activities chosen taking 6 hours (ie not including archery)
		2	additional activities chosen with one timing error eg incorrect time for one activity eg half hour or 15 minute gap left eg missing out lunch break
		1	additional activities chosen with two timing errors
S1Q3a	**6**	**2**	**(£)328.95 for total cost for Option 1 including 15% discount**
		1	(£)387 seen for cost without discount **or** method for 15% eg x0.15 seen or x15 ÷100 **or** method for 85% eg x0.85 seen or x85÷100 **or** complete correct method with one calculation or rounding error *Note: here correct method must include values in working shown*
		3	**value for Option 2 for their total costs for their chosen activities AND archery AND lunch** **eg £552 for 4 additional activities + archery + lunch** ***follow through S1Q2***

		2	value for Option 2 for their total costs for their chosen activities AND archery eg £482.50 for 4 additional activities + archery **or** complete correct method, including archery, with one calculation or rounding error, *correct method must include values in working shown*
		1	(£)69.50 seen for value for lunch cost only **or** (£)96.50 seen for one activity for 10 people **or** cost for their number of activities for one person eg (£)48.25 seen for 5 activities for one person
		1	**suitable choice of option consistent with their calculations AND explanation** **eg 'Option 1 is cheaper'**
S1Q3b	**2** **no marks for repeat calc**	**2**	**a complete correct check of any original calculation seen in 3a using a different method** **eg a reverse calculation OR a calculation using approximate values**
		1	a correct check which is not finished
S1Q4	**3**	**3**	**three comments specific to the candidates work AND relevant to one or more review prompts** **ie other information; sensible answers; methods; difficulty; things to do differently** ***Note: do not accept generic statements***

some acceptable comments	**some unacceptable comments**
eg It would like to know if there were any other options	**eg I had all the information I needed. (ie unqualified/generic)**
eg My answer is sensible because I chose the cheapest option	**eg My answers seemed sensible. (ie unqualified/generic)**
eg My methods worked because I got two amounts to compare **eg My methods worked because my teams were almost equal in fitness scores**	**eg My methods worked well. (ie unqualified/generic)**
eg I found it difficult to fit activities into exact time slots on my timetable	**eg I found Q2 difficult. (ie unqualified/generic)**
eg Next time I would choose different activities **eg Next time I wouldn't do anything differently because I had two teams with equal fitness and 4 activities that fit exactly**	**eg I would do nothing differently. (ie unqualified/generic)**

		2	two comments
		1	one comment
Total for Section 1 25 marks			

Example table for S1Q2

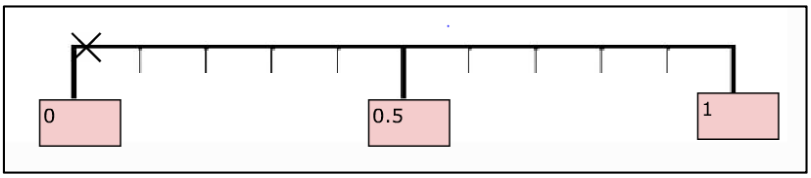
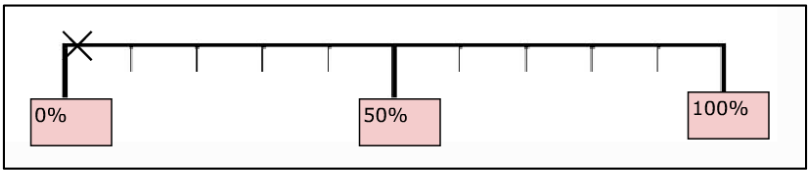


Time	Activity
09:00-09:30	Introduction
09:30-10:45	Quad biking
10:45-12:00	Windsurfing
12:00-13:00	Mountain biking
13:00-14:00	Lunch
14:00-15:00	Archery
15:00-16:30	Tree climbing
16:30-17:00	Prizes

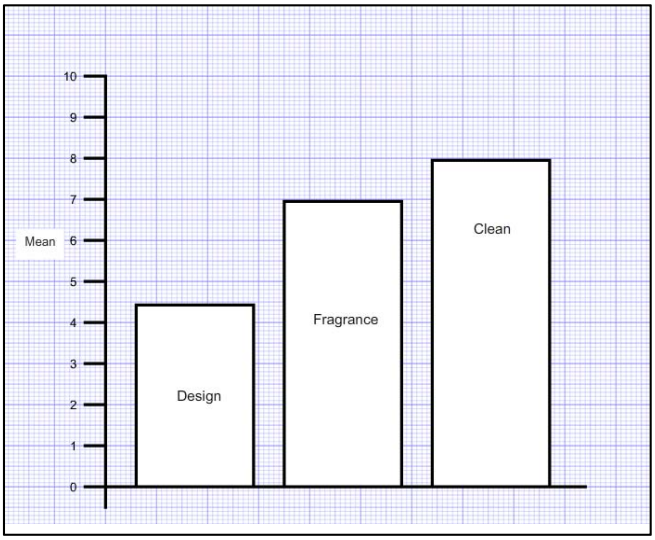
Section 2			
Question	**Total marks**	**Marks**	**Marks awarded for**
S2Q1a	**4**	**1**	**A = 10m ± 0.5m**
		3	**C = 11m ± 0.5m AND D = 9m ± 0.5m AND E = 21m ± 0.5m**
		2	C = 11m ± 0.5m **or** D = 9m ± 0.5m **or** E = 21m ± 0.5m
		1	÷2 **or** x5 seen **or** A = 20 ±1 (small squares) **or** C = 22 ±1 (small squares) **or** D = 18 ±1 (small squares) **or** E = 42 ±1 (small squares) seen in working box **or** A = 4 ±0.2 (squares) **or** C = 4.4 ±0.2 (squares) **or** D = 3.6 ±0.2 (squares) **or** E = 8.4 ±0.2 (squares) seen in working box
S2Q1b	**2**	**2**	**correct explanation of scale used in 1a with reference to scale AND length of scaled line AND actual length** **eg 2 squares = 5m so 4 squares = 10m** **eg 10 small squares = 5m so 42 small squares = 21m**
		1	a partial check of scale used in 1a with reference to scale **or** length of scaled line **and** actual length eg 2 squares = 5m eg 42 small squares = 21m
S2Q1c	**5**	**5**	**499(m^2)** ***follow through Q1a***
		4	values for two areas that form part of the solution eg 400(m^2) from 10 x 40 (A x F) **and** 99(m^2) from 11 x 9 (C x D) eg 189(m^2) from 9 x 21 (D x E) **and** 310(m^2) from 10 x 31 (A x B) eg 840(m^2) from 21 x 40 (E x F) **and** 341(m^2) from 31 x 11 (B x C) **or** complete correct method with one calculation error
		3	value for any one area that forms part of the solution eg 400(m^2) from 10 x 40 (A x F) **or** 99(m^2) from 11 x 9 (C x D) **or** 189(m^2) from 9 x 21 (D x E) **or** 310(m^2) from 10 x 31 (A x B) **or** 840(m^2) from 21 x 40 (E x F) **or** 341(m^2) from 31 x 11 (B x C) **or** value between 493(m^2) and 500(m^2) from squares counted x 6.25
		2	a method for finding one of the areas eg 10 x 40 (A x F) **or** 11 x 9 (C x D) **or** 9 x 21 (D x E) **or** 10 x 31 (A x B) **or** 21 x 40 (E x F) **or** 31 x 11 (B x C) **or** their number of squares counted x 6.25
		1	number of squares counted between 79 **and** 80 or equivalent **or** 6.25(m^2) for area of one square
S2Q2	**5**	**5**	**decision consistent with their result from 1c AND suitable explanation for their area with reference to comparative values** **eg 'yes' AND 499 > 480 (from 320 + 50% = 480)** **eg 'yes' AND 179 > 160 (499 – 320 = 179 > 50% of 320)** **eg 'yes' AND 55% > 50% (499 – 320 = 179 then 179 ÷ 320 = 0.5*59375* URT)** **eg 'yes' AND 166.3 > 160 (499 ÷ 3 = 166.3)** ***follow through 1c (may give a 'no' decision)***
		4	correct calculations as above with wrong decision
		3	480(m^2) seen anywhere **or** 160(m^2) for 50% of 320(m^2) **or** value for 50% of their area eg 166.3(m^2) for 499(m^2) ÷3
		2	method for 50% more of 320 eg x 1.5 **or** method for 50% less of their area eg ÷ 3 **or** value for the difference between areas eg 179(m^2) from 499(m^2) - 320(m^2)
		1	method for finding 50% seen eg x 0.5 **or** x ½
S2Q3a	**5**	**4**	**8.74(m) accept 8.7*39014478(*m) URT**
		3	7.*239014478(*m) URT

			or complete correct method with one calculation error
		2	285 (inches) for conversion of 23 (feet) and 9 (inches) **or** substitution into formula using their converted value for *F*
		1	x 12 for conversion of feet to inches
		1	**rounded up value eg 9m**
S2Q3b	**4**	**4**	**7 for value for length of both sides divided by rounded length for pitch *follow through 3a***
		3	4 pitches (40m) **and** 3 pitches (28m)
		2	4 pitches (40m) **or** 3 pitches (28m) **or** 7.55 (pitches) URT **or** 4.44 (pitches) **and** 3.11 (pitches) URT
		1	÷ 9 seen **or** 40(m) **and** 28(m) seen
			Total for Section 2 25 marks

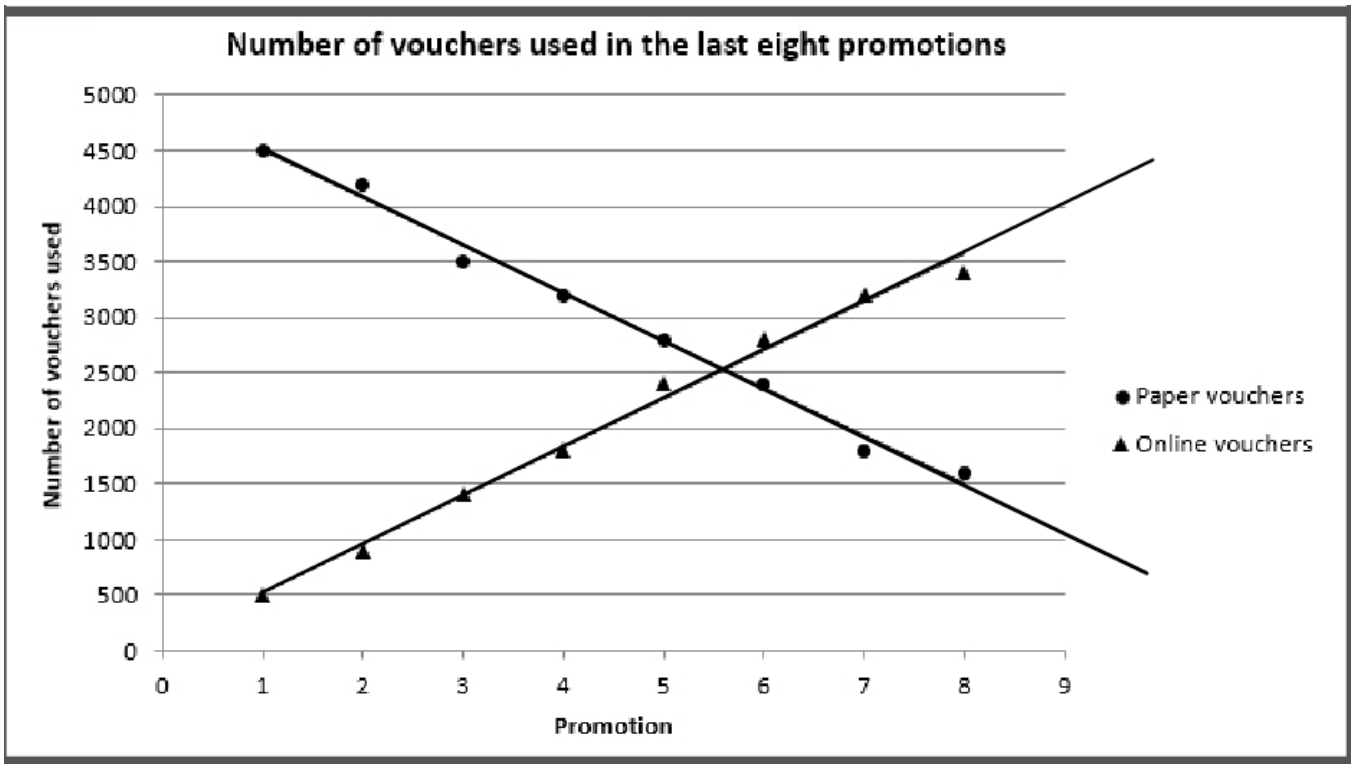
<table>
<tr><th colspan="4">Section 3</th></tr>
<tr><th>Question</th><th>Total marks</th><th>Marks</th><th>Marks awarded for</th></tr>
<tr><td rowspan="4">S3Q1a</td><td rowspan="4">4</td><td>4</td><td>3 correct averages corresponding to their choice
<table>
<tr><th></th><th>Design of bottle</th><th>Fragrance</th><th>Hands clean</th></tr>
<tr><td>Mean</td><td>4.5</td><td>7</td><td>8</td></tr>
<tr><td>Median</td><td>4</td><td>6.5</td><td>8.5</td></tr>
<tr><td>Mode</td><td>6</td><td>6</td><td>9</td></tr>
</table></td></tr>
<tr><td>3</td><td>one correct average corresponding to their choice
or 3 consistent correct averages if no choice or incorrect choice indicated
if more than one type of average is attempted and there are some incorrect values
allow 3 marks if one set of values is clear and correct
eg all medians correct</td></tr>
<tr><td>2</td><td>complete correct method and value for one average if no choice or incorrect choice indicated
eg 54 ÷ 12 = 4.5 for median incorrectly stated</td></tr>
<tr><td>1</td><td>method for one average mean, median or mode
mean: ÷12 or 54 or 84 or 96 seen
median: attempt to order data to find middle or (n+1) / 2th place seen
eg 3, 3, 3, 3, 4, 4, 4, 6, 6, 6, 6, 6, 6 (design)
mode: attempt to tally seen
eg 4 x 3, 3 x 4, 5 x 6 (design)</td></tr>
<tr><td>S3Q1b</td><td>1</td><td>1</td><td>suitable explanation
eg mean: includes all the test data
eg median: because there is an outlier in fragrance (others median to enable one average to be used)
eg mode: because it is the rating chosen by the most people</td></tr>
<tr><td rowspan="3">S3Q2a</td><td rowspan="3">3</td><td>3</td><td>all three values for range correct
<table>
<tr><th></th><th>Range</th></tr>
<tr><td>Design of bottle</td><td>3</td></tr>
<tr><td>Fragrance</td><td>8</td></tr>
<tr><td>Hands clean</td><td>4</td></tr>
</table></td></tr>
<tr><td>2</td><td>one range correct</td></tr>
<tr><td>1</td><td>max and min seen for one range
ie 6 and 3 or 10 and 2 or 10 and 6</td></tr>
<tr><td rowspan="2">S3Q2b</td><td rowspan="2">2
no marks for repeat calc</td><td>2</td><td>a complete correct check of any original calculation seen in 2a using a different method
eg a reverse calculation OR a calculation using approximate values</td></tr>
<tr><td>1</td><td>a correct check which is not finished</td></tr>
<tr><td rowspan="5">S3Q3</td><td rowspan="5">5
no marks for line graph, pie chart, or table</td><td>1</td><td>bar chart with 3 bars only showing their averages</td></tr>
<tr><td>1</td><td>suitable vertical axis label AND bar labels/ key
Note: allow references to average in title or key as alternative to vertical axis label</td></tr>
<tr><td>1</td><td>continuous linear scale on vertical axis starting at (implied) zero and sufficient for their values</td></tr>
<tr><td>2</td><td>all bar heights correct ± 1 small square</td></tr>
<tr><td>1</td><td>one bar height correct ± 1 small square</td></tr>
</table>

S3Q4	**2**	**1**	**suitable comment using their average** **eg '(generally) they liked the fragrance'**
		1	**valid comment about their range with reference to variation/consistency (of data)** **eg 'there was a large variation in opinion'**
S3Q5a	**3**	**1**	**straight line extension of both trend lines to Promotion 9**
		2	**a value between 900 and 1200 for paper vouchers** **AND a value between 3900 and 4100 for online vouchers**
		1	a value between 900 and 1200 for paper vouchers **or** a value between 3900 and 4100 for online vouchers **or** both values above in incorrect order
S3Q5b	**4**	**2**	**0.01 or 1% or 1/100 or 1 in 100 chance or 1 out of 100** ***do not allow 1:100*** ***follow through Q5a***
		1	1000/100000
		1	**end points clearly labelled ie 0 and 1 or 0% and 100%**
		1	**point marked clearly for their probability** **eg for 0.01 point marked clearly closer to 0 than 0.1**  
S3Q5c	**1**	**1**	**suitable explanation consistent with their decision and reference to (use of) paper vouchers** **eg 'no' and '(use of) paper vouchers decreasing'** **eg 'yes' and '1000 vouchers expected to be used'** **eg 'their opinions varied a lot'**
		Total for Section 3	**25 marks**

Example chart for S3Q3
Mean



Example trend lines for S3Q5a



Level 2 Sample Paper 1			
Coverage and Range (Technical Skills)	**Section 1**	**Section 2**	**Section 3**
C2.1 Understand and use positive and negative numbers of any size in practical contexts	✓	✓	✓
C2.2 carry out calculations with numbers of any size in practical contexts, to a given number of decimal places	✓	✓	✓
C2.3 Understand, use and calculate ratio and proportion, including problems involving scale		✓	
C2.4 Understand and use equivalences between fractions, decimals and percentages	✓	✓	✓
C2.5 Understand and use simple formulae and equations involving one- or two-step operations		✓	
C2.6 recognise and use 2D representations of 3D objects		✓	
C2.7 find area, perimeter and volume of common shapes		✓	
C2.8 use, convert and calculate using metric and, where appropriate, imperial measures		✓	
C2.9 collect and represent discrete and continuous data, using ICT where appropriate	✓	✓	✓
C2.10 use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate			✓
C2.11 use statistical methods to investigate situations			✓
C2.12 use probability to assess the likelihood of an outcome			✓