

6

MATHEMATICS

SAMPLE RESPONSES



Walk the line

This booklet is designed to help teachers make overall, on-balance judgments by providing examples of student responses. The responses are not an exhaustive set.

D samples

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Guide to making judgments — Year 6 Mathematics

Purpose: To use non-standard units of measure to estimate distances and to solve related mathematical problems.

Overall grade

The purpose of this QCAT is for students to use non-standard units of measure to estimate distances and to solve related mathematical problems. This response typically demonstrates a limited level of communication, understanding and application of the use of non-standard units of measure to estimate distances and solve multi-step problems. On balance, this work is an overall D.



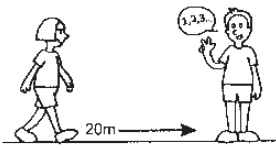
Knowledge and understanding <i>[Q 1, 2a, 2b, 4]</i> Demonstrates variable knowledge and understanding of the use of non-standard units of measure to estimate distances. Correctly completes some cells in the mud map table (Q 4). The step length calculation is correct, but not rounded to the nearest centimetre (Q 1). The personal measurements table (Q 2a) contains a transcription error, which results in an estimate of object length that is incorrectly calculated.	Thinking and reasoning <i>[Q 2c, 3, 5, 6]</i> Number of steps taken for estimates shows some variation to what should be expected. Explanation of possible errors when estimating are mostly unrelated statements. Correctly predicts who has the most steps, but provides no valid reasoning. An attempt has been made to calculate distances and time to school.	Communicating Uses appropriate units in some answers. Working is present, but is mostly irrelevant.	Problem Solving Uses appropriate units in some answers. Working is present, but is mostly irrelevant.	Mathematical Understanding Uses appropriate units in some answers. Working is present, but is mostly irrelevant.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.
Communicating Uses mathematical language to communicate and justify thinking and reasoning.	Thinking and reasoning Number of steps taken for estimates shows some variation to what should be expected. Explanation of possible errors when estimating are mostly unrelated statements. Correctly predicts who has the most steps, but provides no valid reasoning. An attempt has been made to calculate distances and time to school.	Communicating Uses appropriate units in some answers. Working is present, but is mostly irrelevant.	Problem Solving Uses appropriate units in some answers. Working is present, but is mostly irrelevant.	Mathematical Understanding Uses appropriate units in some answers. Working is present, but is mostly irrelevant.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.	Personal Measurements Table Personal measurements table is mostly correct.

Feedback

D Sample: Response 1

Recording personal measurements

- 1 a) Complete the table below to find three personal measurements.
Use a ruler and round your measurements to the nearest centimetre.

Non-standard unit	Personal measurement
 <p>Hand span</p>	<p>My hand span is:</p> <p>.....19..... cm</p>
 <p>Shoe length</p>	<p>My shoe length is:</p> <p>.....25..... cm</p>
 <p>Number of steps taken to walk 20 metres. (Use the track marked out by your teacher for this.)</p>	<p>The number of steps I took is:</p> <p>.....30..... steps</p>

- 1 b) Find the length of one of your steps in centimetres.



- Divide the distance you walked (in centimetres) by the number of steps you took.
- Round your answer to the nearest centimetre.

Show all your working

$$30 \overline{) 2000}$$

One of my step lengths is about66:67 centimetres

STOP HERE: WAIT FOR YOUR TEACHER'S DIRECTIONS

D Sample: Response 1

Now that you have recorded three personal measurements, you will use them to estimate other lengths.

Your teacher will provide an object for you to measure.

- 2 a) Measure the length of the object using your non-standard units. Record them in the table below.

Name of object:blackboard.....

Non-standard unit	Number	Personal measurement (from page 4)
My hand span13..... hand spans19..... cm
My shoe length9..... shoe lengths25..... cm
My step length5..... step lengths30..... cm

- 2 b) Estimate the length of the object by converting your measurements of the object into centimetres.

My calculation of the length of the object:

- using my hand span is247..... cm
- using my shoe length is225..... cm
- using my step length is150..... cm

D Sample: Response 1

2 c) Complete the statements below.

My estimates of the object may not be all the same because of my shoe is
25cm my hand is 19 that is why!

I predict the non-standard unit that would give the most accurate estimate over this distance is:

hand spans

because of the estimate is more bigger than the others

D Sample: Response 1

Write your teacher's step length here:70..... cm

Suppose you and your teacher walked 1000 metres together.

3 a) Who would take the most steps?I would.....

3 b) How many more steps would that person take?2000 more steps.....

Explain how you worked this out.

Show all working.

$$\begin{array}{r} 1000 \\ \times 70 \\ \hline 70000 \end{array}$$

$$\begin{array}{r} 66 \\ \times 1000 \\ \hline 66000 \end{array}$$

↓

$$\begin{array}{r} 70000 \\ 66000 \\ \hline 04000 \end{array}$$

STOP HERE: WAIT FOR YOUR TEACHER'S DIRECTIONS

D Sample: Response 1

4. Complete the table below using information from page 8.

Section	Distance walked in section (steps)	Distance walked in section (metres)	Time arrived at end of section	Time taken for section (minutes)
1. school front gate to corner Danzig Rd & Bridge Rd	1450	241	3:29 pm	14
2. corner of Danzig Rd to western end of the bridge	500	833	3:37 pm	8
3. western to the eastern end of the bridge	150	250	3:41 pm	4
4. eastern end of the bridge to corner Park St & Church Ave	500	270	3:45 pm	4
5. corner of Park St to corner Church Ave & View St	750	1250	4:01 pm	21
6. corner of Church Ave to home	1000	166	4:09 pm	8

5 a) Circle the section that is the shortest distance: 1 2 3 4 5 (6)

5 b) How long did it take Jack to walk home? 1 hour 20 minutes

5 c) How far does Jack walk home in metres? 16650

5 d) Where is Jack when he has walked half the distance home? Circle your answer below.

On Danzig Rd

On Bridge Rd

On the bridge

On Park St

On Church Ave

Explain how you worked this out.

1450 steps
1950 steps
2150 steps
5550

+

3750 steps
2600 steps
4750 steps
11100

$16650 \div 2 = 8325$
Bridge Rd

D Sample: Response 1

- 6 a) Work out the distance (in metres) between the school gate and Jack's home along the new road.

Show all your working. Find Bridge Rd + Bridge + Church Ave

Bridge Rd	1450 steps	840
Bridge	1950 steps	60
	2150 steps	14
Church Ave	3750 steps	
	<u>9300</u>	

- 6 b) State the direction of the school from Jack's house.wast.....

D Sample: Response 2

Guide to making judgments — Year 6 Mathematics Student

Purpose: To use non-standard units of measure to estimate distances and to solve related mathematical problems.

Thinking and reasoning [Q 2c, 3, 5, 6]		Communicating			
Knowledge and understanding [Q 1, 2a, 2b, 4] Demonstrates satisfactory knowledge and understanding of the use of non-standard units of measure to estimate distances, by correctly completing the step length calculation (Q 1), and some cells in the mud map table (Q 4). The personal measurements table (Q 2a) contains a transcription error, which results in an estimate of object length that is incorrectly calculated.	<p>Working shows partial success when providing solutions or explanations.</p> <p>Correctly predicts who has the most steps.</p> <p>An attempt has been made to calculate lengths, times or directions. Explanations are unrelated statements.</p>	<p>Provides occasional but mostly irrelevant working.</p>	<p>Uses appropriate units in some answers. Working is present, but is mostly irrelevant. Some explanations are given.</p>		
Correctly calculated.		Provides occasional but mostly irrelevant working.			
Personal measurements and mud map tables contain some correctly completed cells.		Provides occasional but mostly irrelevant working.			
Personal measurements table is mostly correct.		Provides occasional but mostly irrelevant working.			

Overall grade



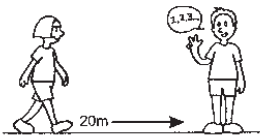
This response shows a sound understanding of the use of non-standard units of measure to estimate distances. However, it demonstrates variable application of strategies to solve mathematical problems and disjointed communication of ideas. Considering the purpose of the task, on balance, this work is an overall D.

Feedback

D Sample: Response 2

Recording personal measurements

- 1 a) Complete the table below to find three personal measurements.
Use a ruler and round your measurements to the nearest centimetre.

Non-standard unit	Personal measurement
 Hand span	My hand span is:19..... cm
 Shoe length	My shoe length is:28..... cm
 Number of steps taken to walk 20 metres. (Use the track marked out by your teacher for this.)	The number of steps I took is:31..... steps

- 1 b) Find the length of one of your steps in centimetres.



- Divide the distance you walked (in centimetres) by the number of steps you took.
- Round your answer to the nearest centimetre.

Show all your working $20\text{m} = 2000\text{cm}$

$$31 \overline{) 2000} = 64.516129$$

rounded to 65cm

One of my step lengths is about65..... centimetres

STOP HERE: WAIT FOR YOUR TEACHER'S DIRECTIONS

D Sample: Response 2

Now that you have recorded three personal measurements, you will use them to estimate other lengths.

Your teacher will provide an object for you to measure.

- 2 a) Measure the length of the object using your non-standard units. Record them in the table below.

Name of object: Blue student desk

Non-standard unit	Number	Personal measurement (from page 4)
My hand span	<u>4</u> hand spans	<u>19</u> cm
My shoe length	<u>2½</u> shoe lengths	<u>28</u> cm
My step length	<u>2</u> step lengths	<u>31</u> cm

- 2 b) Estimate the length of the object by converting your measurements of the object into centimetres.

My calculation of the length of the object:

- using my hand span is 76 cm
- using my shoe length is 70 cm
- using my step length is 62 cm

D Sample: Response 2

2 c) Complete the statements below.

My estimates of the object may not be all the same because my hand, shoe and step length are all different sizes therefore all my answers will differ from one to another

I predict the non-standard unit that would give the most accurate estimate over this distance is:

my shoe length

because my shoe length is in between my hand and my step lengths and they were a bit out.

D Sample: Response 2

Write your teacher's step length here:69..... cm

Suppose you and your teacher walked 1000 metres together.

3 a) Who would take the most steps?Me.....

3 b) How many more steps would that person take?4 more steps.....

Explain how you worked this out.

Show all working.

Teacher 69

$$\begin{array}{r} 100000 \text{ cm} \\ - 69 \\ \hline 99931 \end{array}$$

Steps 99931

Me 65

$$\begin{array}{r} 100000 \text{ cm} \\ - 65 \\ \hline 99935 \end{array}$$

Steps 99935

$$\begin{array}{r} 99935 \\ - 99931 \\ \hline 00004 \end{array}$$

STOP HERE: WAIT FOR YOUR TEACHER'S DIRECTIONS

D Sample: Response 2

4. Complete the table below using information from page 8.

Section	Distance walked in section (steps)	Distance walked in section (metres)	Time arrived at end of section	Time taken for section (minutes)
1. school front gate to corner Danzig Rd & Bridge Rd	1450	87	3:29 pm	14
2. corner of Danzig Rd to western end of the bridge	500	30	3:37 pm	37
3. western to the eastern end of the bridge	200	12	3:41 pm	4
4. eastern end of the bridge to corner Park St & Church Ave	550	270	3:45 pm	4
5. corner of Park St to corner Church Ave & View St	150	9	4:01 pm	16
6. corner of Church Ave to home	1050	63	4:09 pm	8

5 a) Circle the section that is the shortest distance: 1 2 3 4 5 6

5 b) How long did it take Jack to walk home? 54 minutes

5 c) How far does Jack walk home in metres? 471m

5 d) Where is Jack when he has walked half the distance home? Circle your answer below.

On Danzig Rd On Bridge Rd On the bridge On Park St On Church Ave

Explain how you worked this out.

Eastern side of Bridge

D Sample: Response 2

- 6 a) Work out the distance (in metres) between the school gate and Jack's home along the new road.

Show all your working.

measured Bridge Rd to western end of bridge
 +
 measured western end to Eastern end of bridge
 ↓
 on to path
 500
 +200
 = 900 steps

$$\begin{array}{r} 900 \\ \times 60 \\ \hline 54000 \\ 54000 \\ \hline 54000 \text{ metres} \end{array}$$

- 6 b) State the direction of the school from Jack's house.west.....