

Reasoning and Problem Solving

Step 3: Equivalent Lengths – mm and cm

National Curriculum Objectives:

Mathematics Year 3:(3M1a) [Compare lengths \(m/cm/mm\)](#)

Mathematics Year 3:(3M2a) [Measure lengths \(m/cm/mm\)](#)

Differentiation:

Questions 1, 4 and 7 (Reasoning)

Developing Comparing two lengths by converting from mm to cm and vice versa. Lengths increasing in increments of 5mm. All increments shown on a ruler.

Expected Comparing two lengths by converting from mm to cm and vice versa. Lengths increasing in increments of 1mm . All increments shown on a ruler.

Greater Depth Comparing two lengths by converting from mm to cm and vice versa. Lengths in increments of 1mm, using 0 as a place holder in the tens columns for some lengths.

Questions 2, 5 and 8 (Reasoning)

Developing Explain whether a given conversion is correct by converting from mm to cm and vice versa. Lengths increasing in increments of 5mm.

Expected Explain whether a given conversion is correct by converting from mm to cm and vice versa. Lengths increasing in increments of 1mm.

Greater Depth Explain whether a given conversion is correct by converting from mm to cm and vice versa. Lengths in increments of 1mm, using 0 as a place holder in the tens columns for some lengths. Some unconventional partitioning used.

Questions 3, 6 and 9 (Problem Solving)

Developing Find the odd one out and an equivalent length. Lengths increasing in increments of 5mm.

Expected Find the odd one out and an equivalent length. Lengths increasing in increments of 1mm e.g. 52mm, 2cm 3mm etc.

Greater Depth Find the odd one out and two equivalent lengths. Lengths in increments of 1mm, using 0 as a place holder in the tens columns for some lengths. Some unconventional partitioning used.

More [Year 3 Length and Perimeter](#) resources.

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Equivalent Lengths – mm and cm

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1a. Who is correct? Prove it.



Anika

My plant is the tallest. It is 90mm tall.

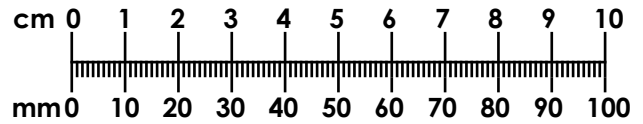
My plant is the tallest. It is 8cm tall.



Oliver



1b. Who is correct? Prove it.



Dominic

My plant has grown the most. It has grown 70mm.

My plant has grown the most. It has grown 6cm.



Muna



2a. Spot two mistakes. Explain your answer.

cm and mm	mm
32cm and 5mm	325mm
4cm and 5mm	45mm
8cm and 5mm	850mm
6cm and 5mm	650mm
9cm	90mm



2b. Spot two mistakes. Explain your answer.

cm and mm	mm
7cm and 5mm	750mm
3cm and 5mm	350mm
9cm and 5mm	95mm
71cm and 5mm	715mm
2cm and 0 mm	20mm



3a. Find the odd one out.

A. 9cm 5mm

B. 95mm



C. 45mm



Write an equivalent length for the odd one out.

Not to scale



3b. Find the odd one out.

A. 3cm 5mm

B. 50mm



C. 35mm



Write an equivalent length for the odd one out.

Not to scale



Equivalent Lengths – mm and cm

Equivalent Lengths – mm and cm

4a. Who is correct? Prove it.



Sophie

I had more hair cut. I had 59mm cut off.

I had 9cm 5mm cut. I had more hair cut.



Alice



R

4b. Who is correct? Prove it.



Aisha

My hair has grown the most. It has grown 56mm.

My hair has grown the most. It has grown 5cm 4mm.



Evie



R

5a. Spot two mistakes. Explain your answer.

cm and mm	mm
24cm and 4mm	244mm
4cm and 1mm	41mm
8cm and 7mm	78mm
19cm and 2mm	92mm
63cm and 4mm	634mm



R

5b. Spot two mistakes. Explain your answer.

cm and mm	mm
35cm and 3mm	353mm
6cm and 8mm	680mm
9cm and 2mm	92mm
75cm and 1mm	751mm
8cm and 1mm	18mm

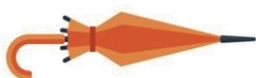


R

6a. Find the odd one out.

A. 51cm 5mm

B. 515mm



C. $51\frac{1}{2}$ cm

D. 5cm 4mm



Write an equivalent length for the odd one out.

Not to scale



PS

6b. Find the odd one out.

A. 84cm 5mm

B. $8\frac{1}{2}$ cm



C. $84\frac{1}{2}$ cm

D. 845mm



Write an equivalent length for the odd one out.

Not to scale



PS

Equivalent Lengths – mm and cm

Equivalent Lengths – mm and cm

7a. Who is correct? Prove it.



Josh

I can jump the highest. I can jump 504mm.



Milly

I can jump the highest. I can jump $54\frac{1}{2}$ cm.



R

7b. Who is correct? Prove it.



Noah

I can hop the furthest. I can hop 660mm.



Jian

I can hop the furthest. I can hop 60 cm 6mm.



R

8a. Spot two mistakes. Explain your answer.

cm and mm	mm
34cm and 0mm	340mm
3cm and 44mm	34mm
30cm and 4mm	304mm
40cm and 4mm	404mm
44cm and 4 mm	440mm



R

8b. Spot two mistakes. Explain your answer.

cm and mm	mm
55cm and 6mm	556mm
5cm and 6mm	56mm
50cm and 6mm	506mm
56cm and 5mm	560mm
6cm and 6 mm	606mm



R

9a. Find the odd one out.

A.



60cm 4mm

B.



604mm

C.

59cm 14mm



D.

$60\frac{1}{2}$ cm



Write 2 equivalent lengths for the odd one out.

Not to scale



PS

9b. Find the odd one out.

A.



$23\frac{1}{2}$ cm

B.



204mm

C.

23m 5mm



D.

235mm



Write 2 equivalent lengths for the odd one out.

Not to scale



PS

Reasoning and Problem Solving Equivalent Lengths – mm and cm

Developing

- 1a. Anika. $90\text{mm} = 9\text{cm}$, which is more than 8cm .
2a. $8\text{cm } 5\text{mm}$ because it is equivalent to 85mm , not 850mm . 6cm and 5mm because it is equivalent to 65mm , not 650mm .
3a. C. Various answers, for example: $4\text{cm } 5\text{mm}$

Expected

- 4a. Alice. $9\text{cm } 5\text{mm} = 95\text{mm}$ which is more than 59mm .
5a. 8cm and 7mm because it is equivalent to 87mm , not 78mm . 19cm and 2mm because it is equivalent to 192mm , not 92mm .
6a. D. Various answers, for example: 54mm

Greater Depth

- 7a. Milly. $54\frac{1}{2}\text{cm} = 545\text{mm}$ which is more than 504mm ?
8a. $3\text{cm } 44\text{mm}$ because it is equivalent to 74mm , not 34mm . $44\text{cm } 4\text{mm}$ because it is equivalent to 444mm , not 440mm .
9a. D. Various answers, for example: 605mm , $60\text{cm } 5\text{mm}$

Reasoning and Problem Solving Equivalent Lengths – mm and cm

Developing

- 1b. Dominic. $70\text{mm} = 7\text{cm}$, which is more than 6cm .
2b. $3\text{cm } 5\text{mm}$ because it is equivalent to 35mm , not 350mm . $7\text{cm } 5\text{mm}$ because it is equivalent to 75mm , not 750mm .
3b. B. Various answers, for example: 5cm

Expected

- 4b. Aisha. $56\text{mm} = 5\text{cm } 6\text{mm}$ which is more than $5\text{cm } 4\text{mm}$.
5b. $6\text{cm } 8\text{mm}$ because it is equivalent to 68mm , not 680mm . $8\text{cm } 1\text{mm}$ because it is equivalent to 81mm , not 18mm .
6b. B. Various answers, for example: $8\text{cm } 5\text{mm}$, 85mm

Greater Depth

- 7b. Noah. $660\text{mm} = 66\text{cm}$ which is more than $60\text{cm } 6\text{mm}$
8b. $56\text{cm } 5\text{mm}$ because it is equivalent to 565mm , not 560mm . $6\text{cm } 6\text{mm}$ because it is equivalent to 66mm , not 606mm .
9b. B. Various answers, for example: $20\text{cm } 4\text{mm}$, $19\text{cm } 14\text{mm}$