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.

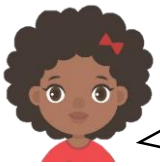
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Equivalent Lengths – mm and cm

1a. Who is correct? Prove it.





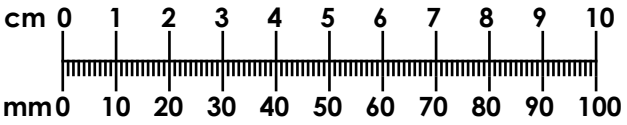
Anika: My plant is the tallest. It is 90mm tall.



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

D R

1b. Who is correct? Prove it.





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



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

D R

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

D R

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

D R

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

D PS

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

D PS

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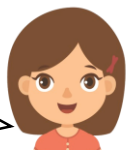
Equivalent Lengths – mm and cm

4a. Who is correct? Prove it.





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

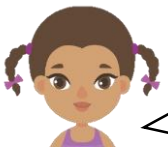


Alice: I had 9cm 5mm cut. I had more hair cut.

E R

4b. Who is correct? Prove it.





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



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

E 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

E 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

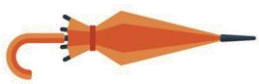
E R

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

E 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

E PS

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Equivalent Lengths – mm and cm

7a. Who is correct? Prove it.



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

Josh



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

Milly

GD R

7b. Who is correct? Prove it.



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

Noah



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

Jian

GD 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

GD 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

GD 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

GD 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

GD PS

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Reasoning and Problem Solving
Equivalent Lengths – mm and cm

Developing

1a. Anika. 90mm = 9cm, which is more than 8cm.

2a. 8cm 5mm 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: 4cm 5mm

Expected

4a. Alice. 9cm 5mm = 95mm 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. $54\frac{1}{2}$ cm = 545mm which is more than 504mm

8a. 3cm 44m because it is equivalent to 74mm, not 34mm. 44cm 4mm because it is equivalent to 444mm, not 440mm.

9a. D. Various answers, for example: 605mm, 60cm 5mm

Reasoning and Problem Solving
Equivalent Lengths – mm and cm

Developing

1b. Dominic. 70mm = 7cm, which is more than 6cm.

2b. 3cm 5mm because it is equivalent to 35mm, not 350mm. 7cm 5mm because it is equivalent to 75mm, not 750mm.

3b. B. Various answers, for example: 5cm

Expected

4b. Aisha. 56mm = 5cm 6mm which is more than 5cm 4mm.

5b. 6cm 8mm because it is equivalent to 68mm, not 680mm. 8cm 1mm because it is equivalent to 81mm, not 18mm.

6b. B. Various answers, for example: 8cm 5mm, 85mm

Greater Depth

7b. Noah. 660mm = 66cm which is more than 60cm 6mm

8b. 56cm 5mm because it is equivalent to 565mm, not 560mm. 6cm 6mm because it is equivalent to 66mm, not 606mm.

9b. B. Various answers, for example: 20cm 4mm, 19cm 14mm

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