

# Solving problems involving length

## National Curriculum attainment target

- Use all four operations to solve problems involving measure [for example, length] using decimal notation, including scaling

## Lesson objective

- Use all four operations to solve problems involving length using decimal notation

### Previous related lesson

Unit 6, Week 3, Lesson 1

### Prerequisites for learning

Pupils need to:

- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- convert between kilometres, metres, centimetres and millimetres using knowledge of place value, multiplication and division

### Vocabulary

kilometre (km), metre (m), centimetre (cm), millimetre (mm)

### Future related lesson

Unit 6, Week 3, Lesson 4

### Success criteria

Pupils can:

- use all four operations and decimal notation to solve problems involving length



## Getting Started

- Choose an activity from Measurement (length).

## Teach

### Resources

metre ruler (per class); Base 10 rods and cubes (per class)

**Collins  
Connect**  
Year 5, Unit 6,  
Week 3



- Display: Slide 1 showing five animals.
- Elicit that the animals are in order of height from the tallest to the smallest.



- Display: Slide 2 showing the animals with their heights.
- Say: **There is something not quite right here. Didn't we agree that the giraffe was the tallest?**
- Ask: **Who can tell us what is missing?** (measurement units) **Which metric unit should we use for the height of the giraffe?** (metre)
- Elicit and then display the appropriate units for the other animals.



- Display: Slide 3.
- Ask: **Who can tell us how to convert metres/millimetres to centimetres?** (multiply the number by 100/divide the number by 10)



- Say: **Tell your partner the centimetre equivalences for the heights of the giraffe, ostrich and koala.** (giraffe: 600 cm, ostrich: 230 cm and koala: 28 cm)
- Provide some children with a metre ruler and Base 10 rods and cubes.
- Say: **Make up the height of the kangaroo using the metre ruler and the least number of rods and cubes.**
- Discuss the composition of 162 cm as 1 metre ruler, 6 rods and 2 cubes.
- Ask: **What fraction of one metre is one rod/cube?** Establish that one rod is one tenth of one metre and that one cube is one hundredth of one metre.



- Ask: **Who can write on the board the height of the kangaroo in metres?** (1.62 m)
- Elicit and then display the heights of the animals using decimal notation.



- Display: Slide 4.
- Ask: **The average length of one kangaroo hop is 750 cm. What distance in metres will it cover in 10 hops?**



- Ask pairs to discuss the question and to shape their answer with the class. Take feedback and elicit that one hop equals 7.5 m so in 10 hops the kangaroo will cover a distance of 75 m.



- Ask: **Who used a different way to calculate the answer?** ( $750 \text{ cm} \times 10 = 7500 \text{ cm} = 75 \text{ m}$ )
- Say: **A football pitch is 100 m long. About how many hops will a kangaroo need to make to travel the length of the pitch?** (14 hops) **Can you justify your answer?** Elicit that 2 hops = 15 m so  $100 \text{ m} \approx (10 + 2 + 2) \text{ hops} = 14 \text{ hops}$  or  $(75 + 15 + 15) \text{ m} = 105 \text{ m}$ .

## Individualised Learning

Refer to Activity 3 from the Learning activities on page 271.

**Pupil Book 5B:** – Page 48: Lengths and distances

Resources: for Challenge 3, ruler (per child), 1 cm squared paper (per child)

**Progress Guide 5:** – Support, Year 5, Unit 6, Week 3, Lesson 3: Ribbon lengths

## Plenary

- Discuss the importance of identifying the relevant information and the appropriate operation in solving a problem and, when appropriate, converting lengths to the same unit.
- Pose the problem: The penguin is 95 cm tall. Imagine three penguins standing on each other's shoulders. If we allow 15 centimetres for the height of the heads of two penguins, what is the approximate height of the three penguins?
- Ask pairs to discuss the question and to share the answer with the class.  
( $95 \text{ cm} \times 3$ ) – 15 cm = 270 cm
- Ask: **Who used a different method to find the answer?** Elicit the method:  
( $95 \text{ cm} - 15 \text{ cm}$ ) + ( $95 \text{ cm} \times 2$ ) = 270 cm.



## Overcoming Barriers

- Since the most common errors are related to place value, check that children understand the relationships between the standard units of length.