Max’s Magnificent Measurement Challenge

Learning objective: To convert between different units of metric measurement (km, m, cm, mm) and solve multi-step problems involving money and mass.

Help Max the monkey solve these mathematical puzzles. Show your working out clearly, ensuring you include the correct units in your final answers. Use your knowledge of place value to convert between units.

Max is planning an expedition to the Great Canopy Forest. He needs to calculate the precise lengths of climbing ropes, the weight of his supplies, and the total cost of his equipment using his pocket money budget of £50.00.

Word bank: millimetres · centimetres · metres · kilometres · conversion · decimal · mass · budget

1. Max has a rope that is 4.5 metres long. He needs to cut off 85 centimetres for a bridge. How many centimetres of rope will he have left? Show your calculation. (2 marks)

2. Max’s backpack weighs 2.4 kilograms. He adds a bag of dried fruit weighing 750 grams. What is the total mass of the backpack in kilograms? (2 marks)

3. The path to the forest is 3.2 kilometres long. Max has already walked 1,450 metres. How many metres does he have left to travel? (2 marks)

4. Max buys three packets of nuts for £1.25 each and a compass for £8.40. If he started with a £20.00 note, how much change does he receive? (2 marks)

5. Explain why it is essential to convert all measurements into the same unit before adding or subtracting them. Provide an example to justify your answer. (3 marks)

6. Max wants to build a shelter using 12 wooden poles. Each pole is 1.2 metres long. If the poles cost 50p per metre, calculate the total cost of the poles. (3 marks)

Draw: Draw a diagram showing Max's backpack with labels for his equipment, including the mass of each item in kilograms and the length of his rope in metres.

Extension challenge: Imagine Max discovers a new, taller tree. Justify your answer to this challenge: If Max climbs 15 metres, then slides down 450 centimetres, then climbs another 8,500 millimetres, how high is he above the ground in total? What might happen if he miscalculates these measurements while climbing?