

Max's Measurement Mission: Calculating Volume

Learning objective: To calculate the volume of cuboids by counting unit cubes and using the formula: length $\times$ width $\times$ height.

Max the monkey is helping his friends pack boxes for a picnic. Use your knowledge of volume to solve these math challenges. Remember to use cubic centimetres (cm³) for your answers. Read each section carefully and show your working out.

Word bank: volume · cuboid · cubic centimetres · length · width · height · formula · space · calculate

1. The Basic Box: Max has a small box that is 3cm long, 2cm wide, and 2cm high. Draw a sketch of the box and calculate its volume using the formula (length $\times$ width $\times$ height). Explain your method. (3 marks)

2. Counting Cubes: Imagine a shape made of 1cm³ blocks. If the shape has a base area of 6cm² and is 3 layers high, how many blocks are there in total? What is the volume? (2 marks)

3. Comparing Containers: Pip the caterpillar has a container with a volume of 20cm³. If the container is 5cm long and 2cm wide, what must the height be? Show how you worked this out. (3 marks)

4. The Picnic Problem: Ellie the elephant needs a box to carry fruit. She finds a box that is 10cm long, 4cm wide, and 5cm high. Calculate the total volume of this box in cm³. (2 marks)

5. Real-world Reasoning: Why do we use cubic centimetres (cm³) instead of square centimetres (cm²) to measure the space inside a box? Think about the dimensions involved. (2 marks)

Extension challenge: Find an object in your classroom that is a cuboid. Measure the length, width, and height using a ruler (round to the nearest centimetre) and calculate its approximate volume.