

Grade 4 Math Assessment: Understanding Volume

Learning objective: To calculate the volume of cubes and cuboids using standard units (cm^3) and estimate the volume of irregular shapes.

Read each question carefully. Use your ruler if necessary. Show all your working out to gain full marks. Max the monkey is watching, so make sure your calculations are precise!

Max the monkey is helping his friends organize their supplies. He needs to calculate the space inside different boxes to see how many building blocks will fit inside. Remember: Volume = length $\times$ width $\times$ height.

Word bank: Volume · Cubic centimetres · Capacity · Dimensions · Length · Width · Height · Formula · Irregular

1. Max has a cube with a side length of 3cm. Calculate the volume of this cube in cm^3 . Show your working. (2 marks)

2. A storage crate has a length of 5cm, a width of 2cm, and a height of 4cm. What is the total volume of the crate? (2 marks)

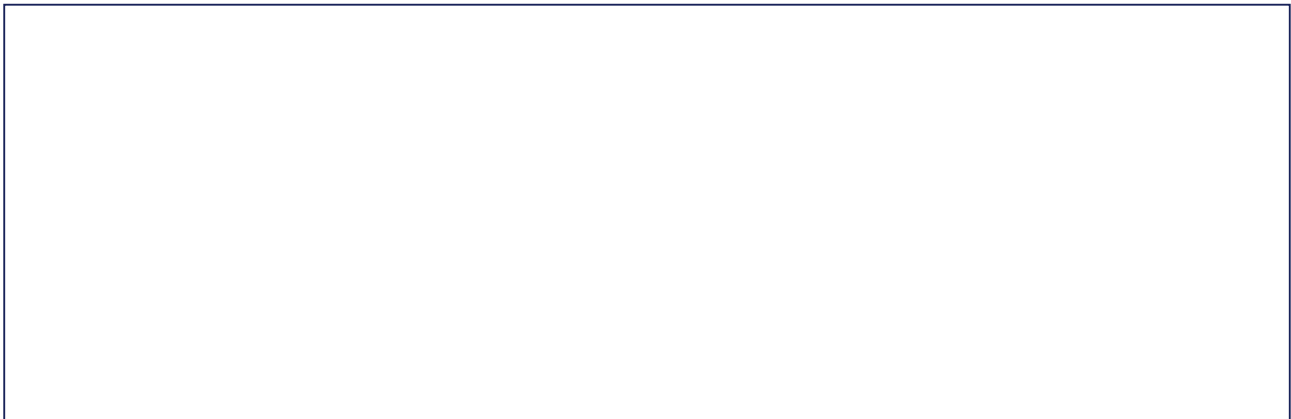
3. Pip the caterpillar is moving books into a box. If the box has a volume of 60cm^3 and the base area is 15cm^2 , what is the height of the box? (3 marks)

4. Zara the zebra has two boxes. Box A is $4\text{cm} \times 4\text{cm} \times 4\text{cm}$. Box B is $6\text{cm} \times 3\text{cm} \times 2\text{cm}$. Which box has the larger volume? Explain how you know. (4 marks)

5. Ellie the elephant needs to transport water. She has a container shaped like a cuboid. It costs £2 per cubic centimetre to fill it with a special protective liquid. If the container is 10cm long, 5cm wide, and 2cm high, how much will it cost to fill it completely? (4 marks)

6. Extended Writing Task: You are designing a custom toy box for Kit the fox. The box must have a volume of exactly 100cm^3 . Describe the dimensions (length, width, and height) you would choose for the box. Explain why you chose these dimensions and calculate the total surface area if each face were made of wood costing £1 per square centimetre. (10 marks)

Draw: Draw a cuboid with a length of 4cm, a width of 2cm, and a height of 3cm on the grid paper provided below. Label the dimensions clearly.



Extension challenge: Total: /25