Measuring Volume in Cubic Metres

You will need
- metre sticks or 1 m rolls of newspaper
- a large base ten cube

GOAL

Estimate, measure, and compare volumes using cubic metres.

About how much would it cost to ship a box as big as your classroom?

Sam's Solution

cubic metre (m³)

The volume of a cube that is 1 m long, 1 m wide, and 1 m high

For example, the volume of this refrigerator is about 1 m³.

I'll start by making a **cubic metre (m³)**. I can make a square that has 1 m sides and then add more edges to make the square into a cube that's 1 m tall.

A. Make a square metre on the floor using metre sticks or newspaper rolls 1 m long. Add more metre sticks or newspaper rolls to make the square into a cubic metre.

B. What can you see at your school that might have a volume of more than 1 m³? Estimate the volume.

C. About how many boxes the size of a cubic metre would you need to fill your classroom? Explain your thinking.

D. If it costs $100 to ship 1 m³, about how much would it cost to ship a box that is the size of your classroom?

Reflecting

E. How do you know that 1 m³ is more than 100 cm³?

F. Could a package that is not shaped like a cube cost $100 to send? Explain your thinking.

Checking

1. How many large base ten cubes would fit into 1 m³? How do you know?
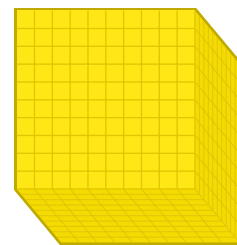
2. Which volume is closest to the volume of a minivan: 2 m³, 20 m³, or 200 m³?

Practising

3. **a)** Is a jewellery box more likely to be measured in cubic centimetres or cubic metres? Explain your thinking.
   b) Why would you measure the volume of a large base ten cube in cubic centimetres, not cubic metres?

4. What object might have a volume of about 400 m³?

5. A statue of Tommy the Turtle stands in Boissevain, Manitoba, near the border between Canada and the United States. The pink cube in the picture shows how Tommy's size compares with a cubic metre.
   a) Estimate the volume, in cubic metres, of a box that would be large enough to hold Tommy. (Don't include the flags.) Explain how you estimated.
   b) If you measured the volume of the box in cubic centimetres, would the number of cubic centimetres be more or less than the number of cubic metres you estimated for part a)? Explain.
   c) How can you decide whether to measure the volume of an object in cubic centimetres or cubic metres?

cubic metre

6. Which is the most reasonable estimate for each volume?
   a) the eraser on a pencil: 1 cm³ or 10 cm³ or 1 m³
   b) a box for a reclining chair: 1 m³ or 10 m³ or 100 cm³
   c) a hockey puck: 3 m³ or 30 cm³ or 3 cm³

7. Give three examples of objects that it would make sense to measure in cubic metres.