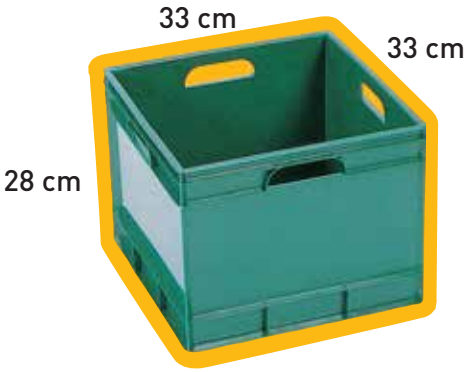
Books in Boxes

ACTIVITY

You need: a ruler, a calculator, a class set of books, weighing scales



Dean and Sophie are putting sets of books into plastic boxes. Measured inside, each box is 33 centimetres long, 33 centimetres wide, and 28 centimetres high. Its mass, when empty, is 2.3 kilograms.

The principal doesn't want the total mass of each box to exceed 20 kilograms. And so that they can be stacked, he doesn't want them to be filled above the top edge.

Dean and Sophie start with the dictionaries and atlases. First, they measure and weigh one of each.

Atlas: 29 x 22 x 1.8 cm
Mass: 1 490 g

Dictionary: 19.5 x 13 x 3.8 cm
Mass: 510 g

1. **a.** If there were no limit on the mass, how many atlases could go in 1 box? Show how they could be packed.
   b. If the box had that number of atlases in it, what would its mass be?
   c. How many atlases could the box hold without exceeding the 20 kilogram limit? Explain your reasoning.
   d. When the box is correctly packed (as in **c**), what percentage of its volume do the books occupy?

2. **a.—d.** Do the same set of tasks (as in question **1**) for the dictionaries.

3. **a.** Find the mass of 1 Figure It Out book. How many could be packed in a box without exceeding the 20 kilogram limit?
   b. Calculate the volume of this number of Figure It Out books.
   c. What percentage of the volume of the box would these books occupy? What does this answer mean?