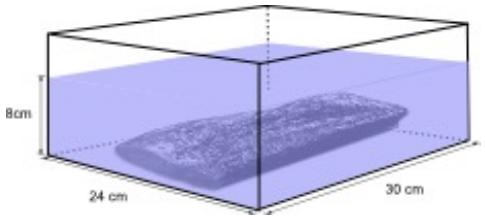
6.G Computing Volume Progression 4

Task

A rectangular tank is 24 cm wide, and 30 cm long. It contains a stone and is filled with water to a height of 8 cm. When Amy pulls the stone out of the tank, the height of the water drops to 6 cm. Find the volume of the stone.



IM Commentary

This is the last in a series of four tasks that gradually build in complexity. The purpose of this series of tasks is to build in a natural way from accessible, concrete problems involving volume to a more abstract understanding of volume. This problem is based on Archimedes' Principle that the volume of an immersed object is equivalent to the volume of the displaced water. While the stone itself is an irregular solid, relating it to the displaced water in a rectangular tank means that the actual volume calculation is that of a rectangular prism, and therefore, fits in with content standard 6.G.2.

Solution

The change in water height is 8 cm-6 cm$=2$ cm. The volume of the displaced water

is the product of the length, width, and change in the height of the water, and $24 \times 30 \times 2 = 1440$.

The volume of the stone is the same as the volume of the displaced water, we know the stone has volume 1440 cm^3.