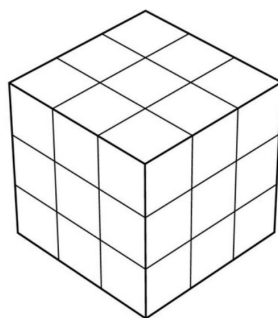


Cutting a $3 \times 3 \times 3$ cube.

Submission deadline: September 28th 2026

A $3 \times 3 \times 3$ cube can be cut into 27 unit cubes (each $1 \times 1 \times 1$) in six cuts with a large saw. However, if after every cut you can rearrange the pieces before cutting, can you do it in less than 6 cuts? If so, how? And if not, why?



The problem was correctly solved by :

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Solution 1: The center cube is attached along 6 faces to the rest of the cubes. A single cut cannot separate more than one side of the center cube, even after rearrangements. Thus 6 cuts is minimal.

Solution 2: After one cut, we have one $1 \times 3 \times 3$ block and one $2 \times 3 \times 3$ block. The latter has 18 pieces. We have already made one cut, so if it was possible to do this in 5 cuts or less, we should be able to separate the 18 pieces in 4 cuts. But 4 cuts can make a maximum of $2^4 = 16$ pieces.