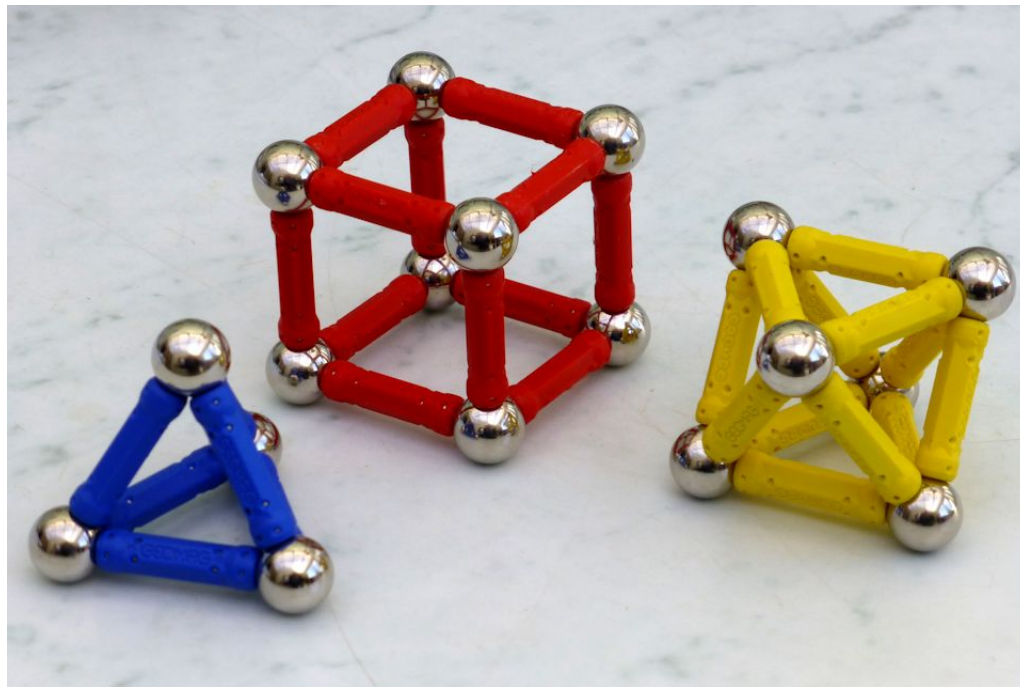
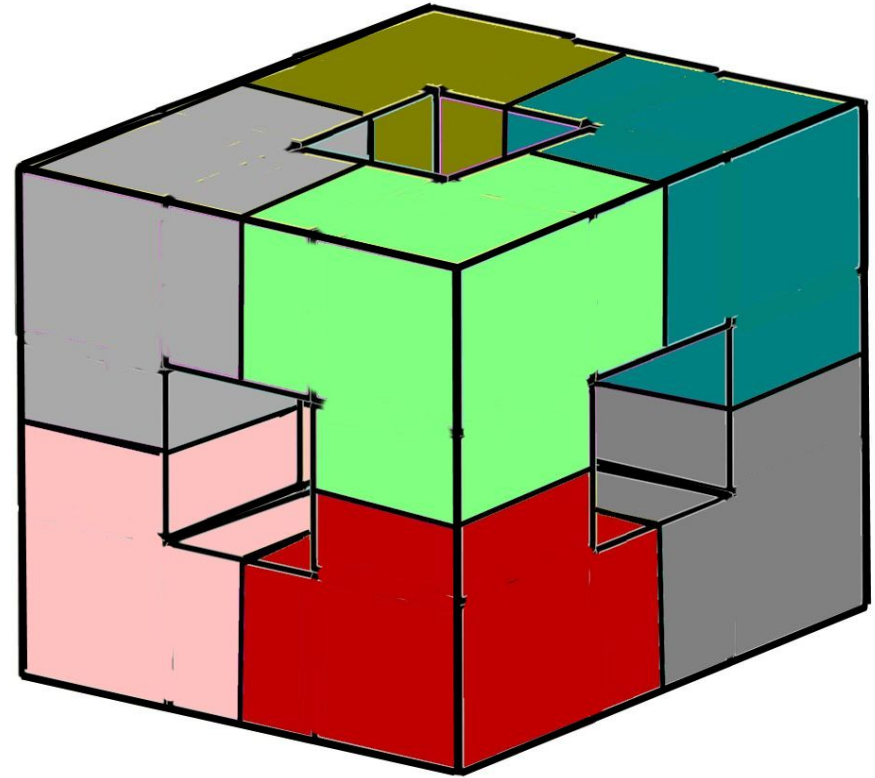
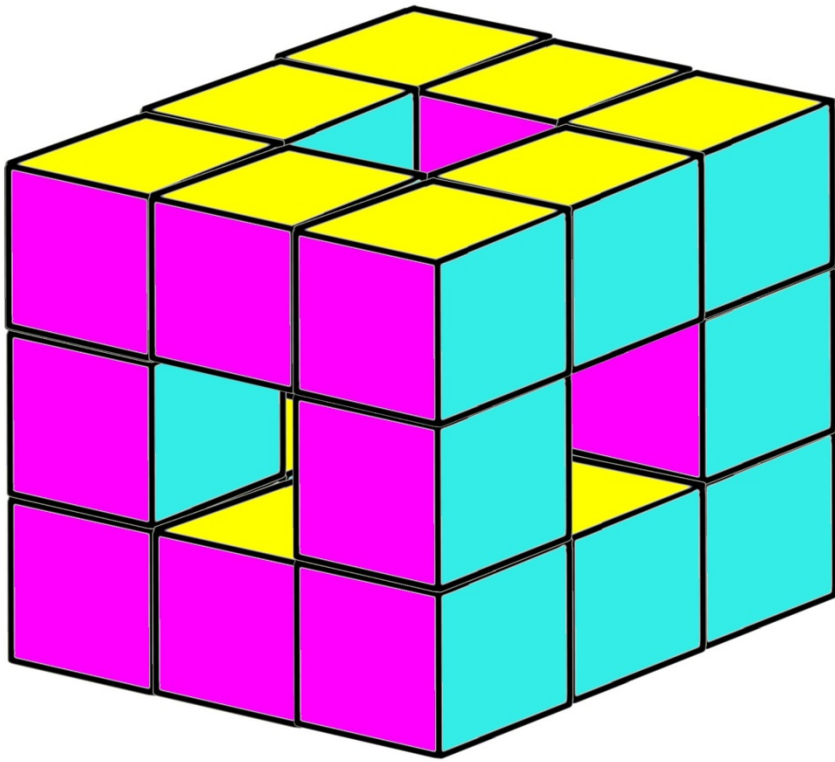


Platonic Skeletons  
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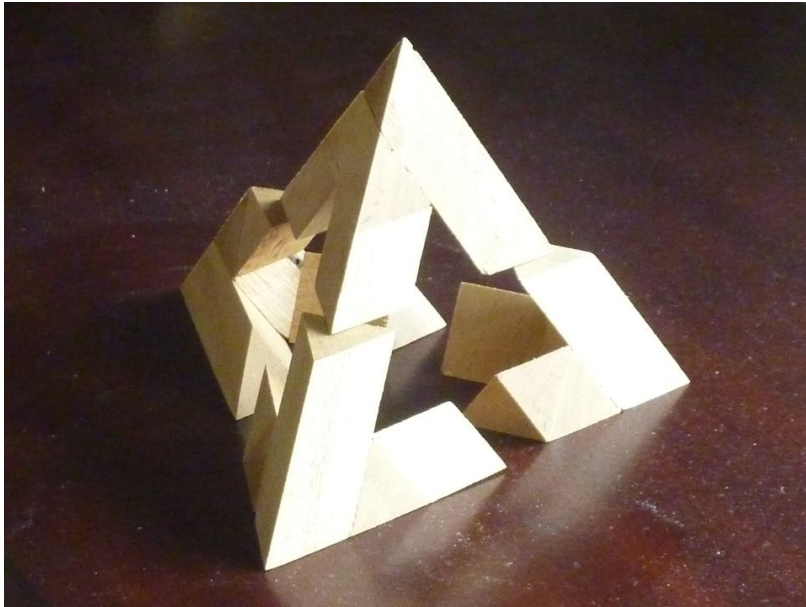
Puzzles based on skeletal tetrahedron, cube and octahedron – three of the "Platonic Solids"

# The "Skeleton Cube" Puzzle



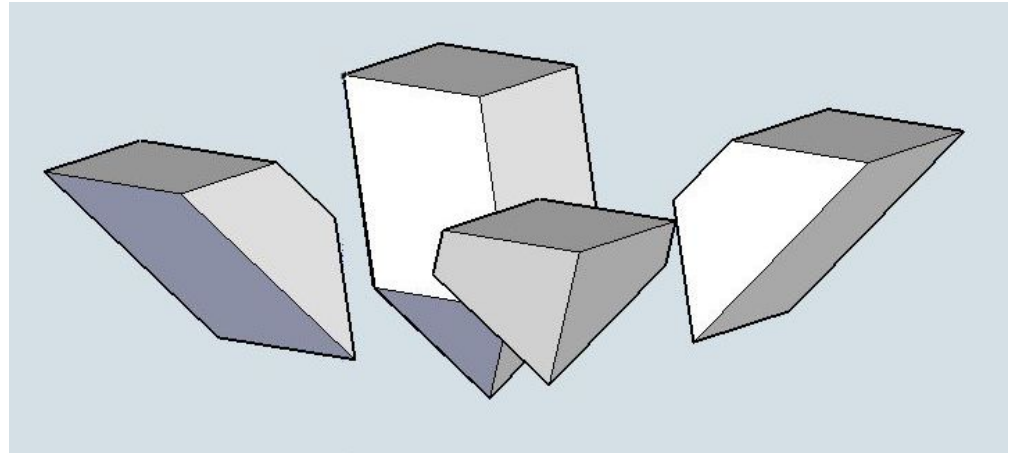
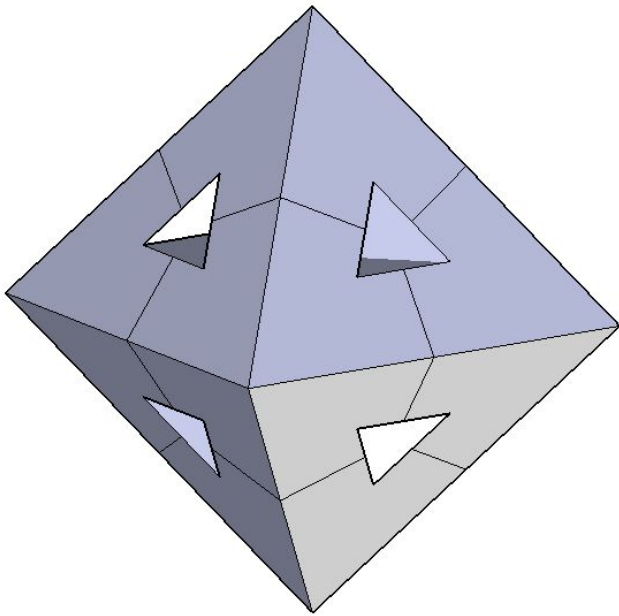
3x3x3 cube – remove 7 cubes to leave a "skeleton"  
Cut the edges to make 8 corners  
Vary the type of cut to make a put-together puzzle

# The "Skeleton Tetrahedron" Puzzle



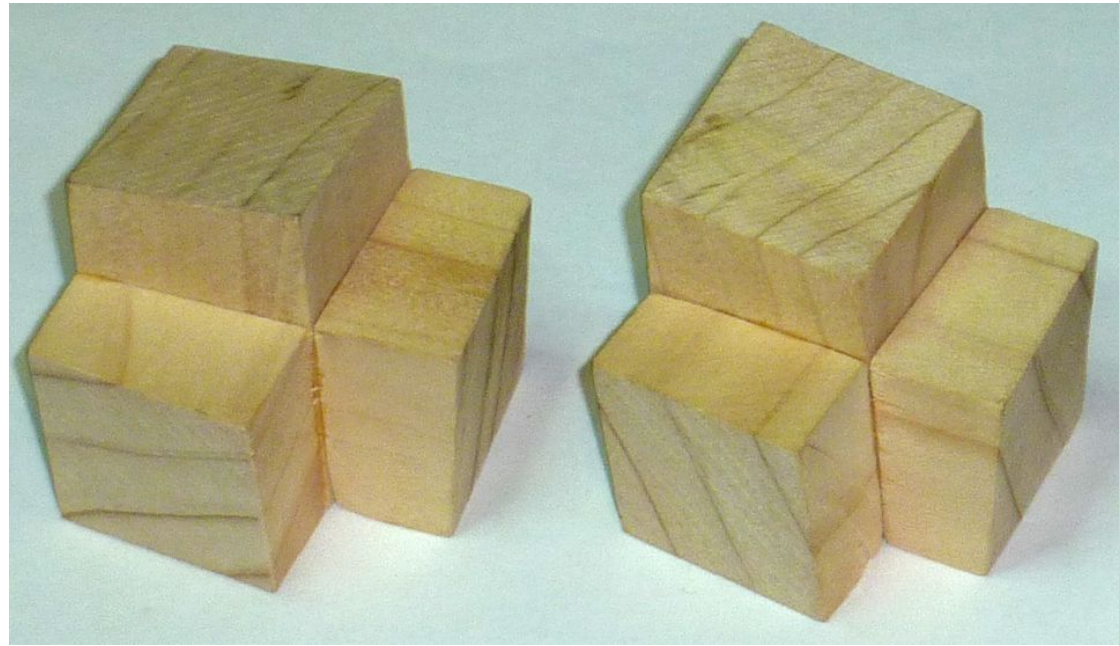
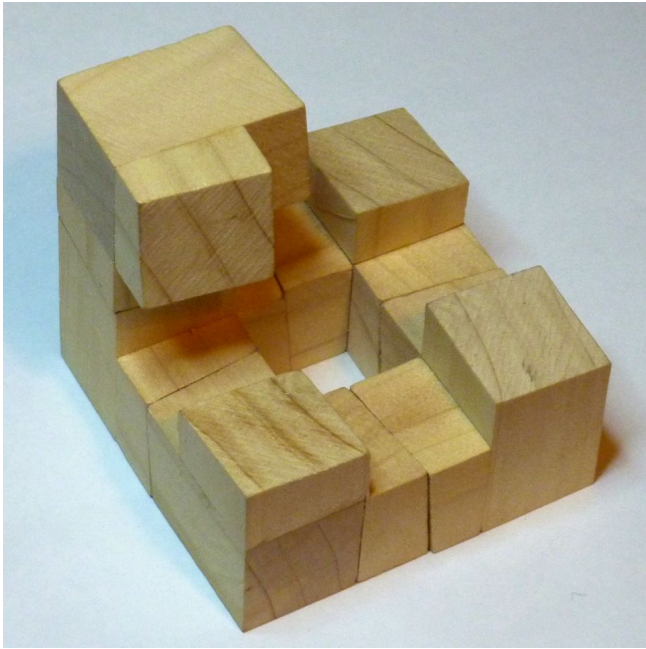
Four pieces (since a tetrahedron has four vertices)  
Angled cuts, so a "+" face mates with a "-" face  
Tricky to make – trivial to solve  
Even a "Double Tetrahedron" puzzle is too easy

# The "Skeleton Octahedron" Puzzle



Six pieces (since an octahedron has 6 vertices)  
Each piece has four edges which may be cut in a variety of ways to make a put-together puzzle.  
The real mathematical interest is the construction of each corner piece from four sub-units!

# Cutting the edges of the "Skeleton Cube" Puzzle



The difficulty of the puzzle depends entirely on the method of cutting each of the edges at a slight angle

Side-to-side or corner-to-corner

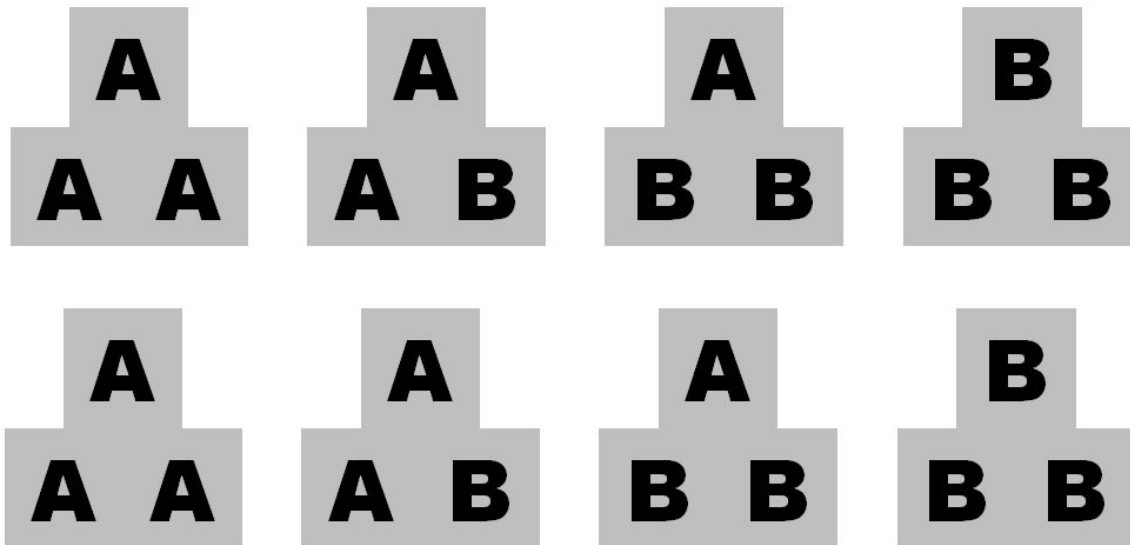
And there are (at least) four different collections of cuts (making four quite different puzzles)

# Four different kinds of "Skeleton Cube" Puzzle (but they all look confusingly alike!)

Type 1 – edges cut corner-to-corner

But only two types of mating faces

"A" only mates with "B", so there are only four different puzzle pieces, with two of each (easy!)

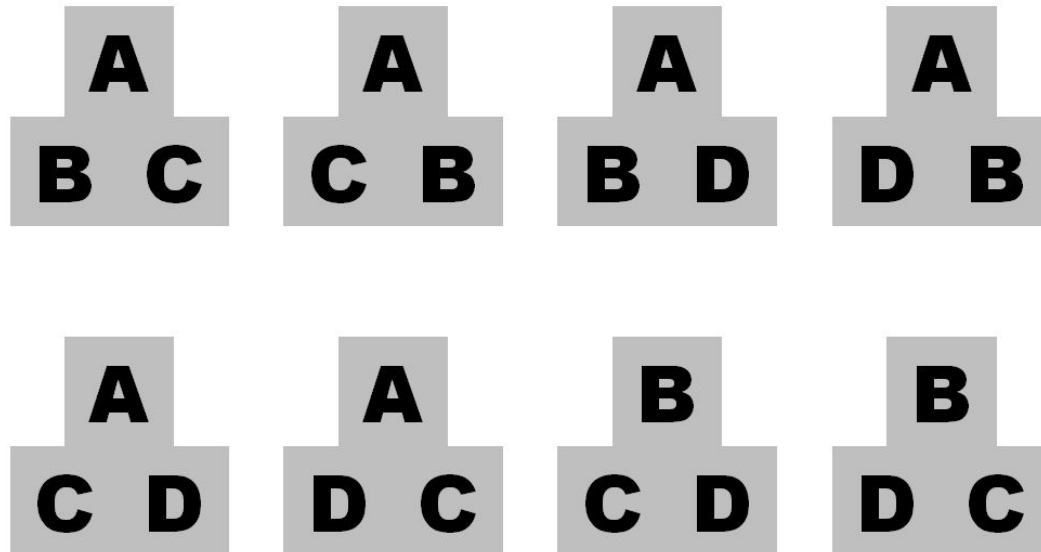


# Four different kinds of "Skeleton Cube" Puzzle (Type 2)

Type 2 – edges cut side-to-side

Four types of mating faces, A to D

"A" mates with "B" and "C" mates with "D", so there are now eight different puzzle pieces, in four anti-symmetric pairs (much harder!)

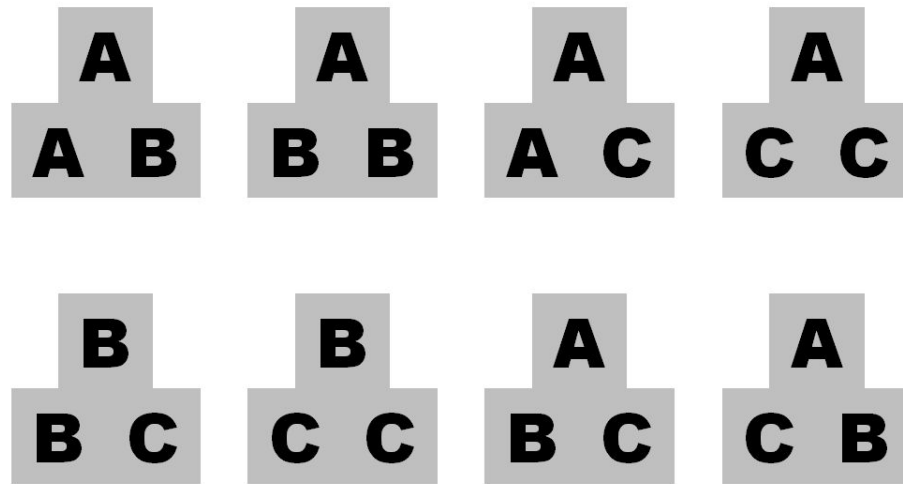


# "Skeleton Cube" Puzzle - (Types 3 and 4)

Edges cut corner-to-corner in both cases

Type 3 has only three types of cut face, A, B and C

"A" mates with "B" and "C" mates with another "C"  
again four anti-symmetric pairs (quite hard!)



Type 4 has four types of cut face, A, B, C, D

Mating is A to B, C to C and D to D.

Layout of cut faces is like Type 2 (eight pieces again)