

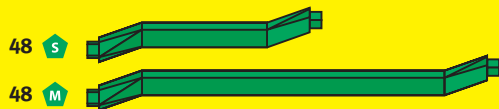
ZOME ADVANCED MATH KIT

PROFESSIONAL SERIES

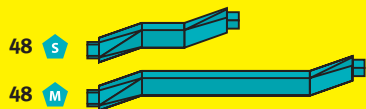
PARTS LIST:



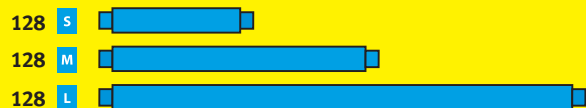
300 This Zome Advanced Math Kit contains **1308** Zome Pieces — with 300 Zome Balls, 96 New Zome Green Struts in 2 sizes, 144 New Zome Blue Green Struts in 3 sizes, as well as 384 Zome Blue Struts in 3 sizes, 240 Yellow Struts in 3 sizes, and 144 Red Struts in 3 sizes.



New! Zome Green Struts — in 2 sizes!

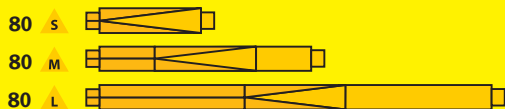


New! Zome Blue Green Struts — in 3 sizes!



So what's a Zome GreenLine?

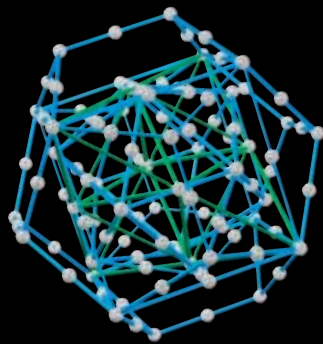
It's an amazing new addition to the Zome System. If you have used other Zome Kits, you have worked with Blue Struts, Yellow Struts and Red Struts. The new Zome Advanced Math Kit offers new angles, new structures and a world of new Zome possibilities!



Visit www.zomesystem.com to get more information and parts! To speak with us, call 1-888-ZOMEFUN

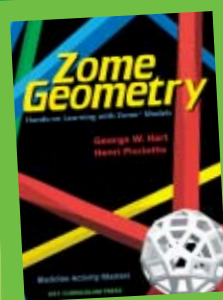
Zometool, Inc., 1526 South Pearl St., Denver, CO 80210 303.733.2880 © 2002 Zometool, Inc., Zome, Zome System and Zometool are Registered Trademarks of Zometool, Inc. — US Patent RE 33785

EXPAND YOUR ZOME HORIZONS!



With *Zome Advanced Math Expanded Kit with GreenLines*, you'll build an amazing new Zome world! Go to zomesystem.com to see step-by-step illustrated instructions to build your own "Kepler's Obsession."

(Instructions not found in this kit.)



Zome Geometry: Hands-on Learning with Zome Models
By George W. Hart and Henri Picciotto

Hands-on training from the **ONLY** High School and College level text written especially for Zome System™!

Mathematically fascinating. Visually exciting! Unravel the mysteries of Zome System model-building components, based on the Fibonacci numbers and the golden mean.

Carefully-sequenced lessons challenge and guide you as you build amazing models. Probing questions reflect on the relationships you can clearly visualize.

Over 60 detailed activities and 150 explorations of Zome Geometry build your spatial, conceptual, visualization and geometric skills, including:

- Proportion, symmetry, area, volume and coordinates
- Proof that there are only five Platonic solids
- Analysis of the 13 Archimedean solids
- Exercises that let you rediscover Euler's theorem and verify Descartes' theorem of angular deficit
- Space filling, duality, fractals and the 4th dimension

Get yours today! Available online at

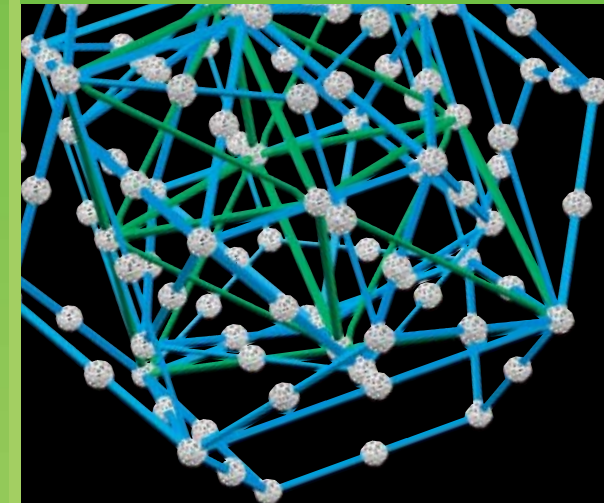
www.zomesystem.com

PROFESSIONAL SERIES



ADVANCED MATH

EXPANDED KIT WITH GREENLINES



Featuring the ingenious new

Zome GreenLines

A robust kit with the new Zome GreenLines that expand the Zome System to let you build:

- True Diagonals to Blue Squares and Cubes
- Oct-tet Trusses
- Regular Platonic Solids and their Truncations
- Regular Octagons and Archimedean Solids (in BlueGreenLines)

And much more...



Warning: Swallowing Danger
CONTAINS SMALL PARTS that are NOT
suitable for children under 3 years of age.

Before you begin these difficult GreenLine constructions, please follow these steps:

1. Get to know other Zome colors first!

Build models from Zome Manual 2.0 using Zome Blue, Yellow and Red Struts. Because each Green Strut can occupy 5 different positions in each pentagonal hole, they are 5 times more difficult to handle.

2. Read the Zome GreenLines instructions included separately in this kit!

Build simple Zome GreenLine models before trying the models in this booklet.

3. If you have the book *Zome Geometry*, work through these models in conjunction with the text!

Zome Geometry, by George Hart and Henri Picciotto, provides a full discussion of Zome GreenLines in relation to the rest of the Zome System. A full description of the book — and details on how to get it — are located on the outside of this instruction booklet.

For each construction, the relevant chapter in the text is noted.

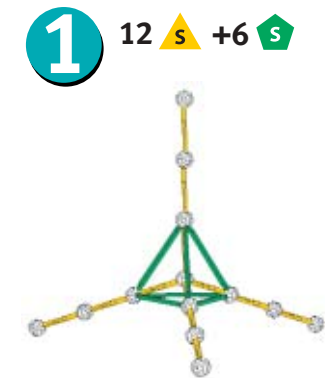
Truncated Tetrahedron

Chapter 3, Challenge 3.4

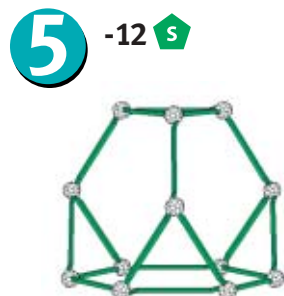
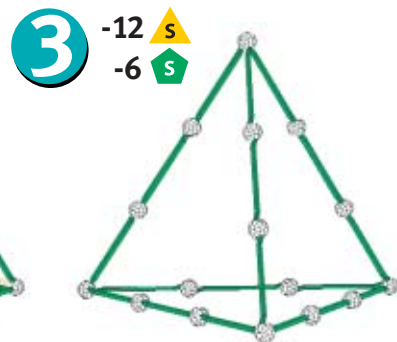
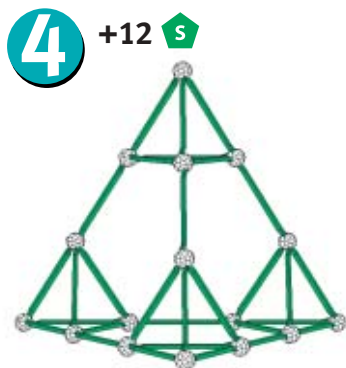
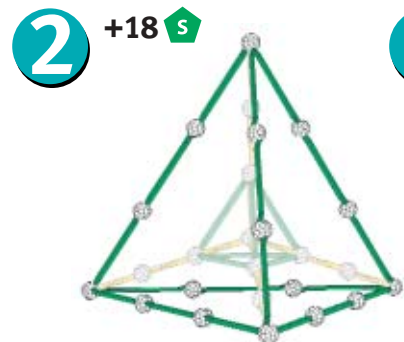
Begin by constructing a temporary stabilizer, built with 12 short yellows and 6 short greens, that will later be removed (1).

Connect a regular Tetrahedron with 18 short greens around the stabilizer (2).

Remove the entire stabilizer (3), then “slice” through the 4 corners of the Tetrahedron with 12 additional short greens (4).



After completing 4 slices, remove the 12 greens from each corner. The completed model reveals the truncated Tetrahedron (5).



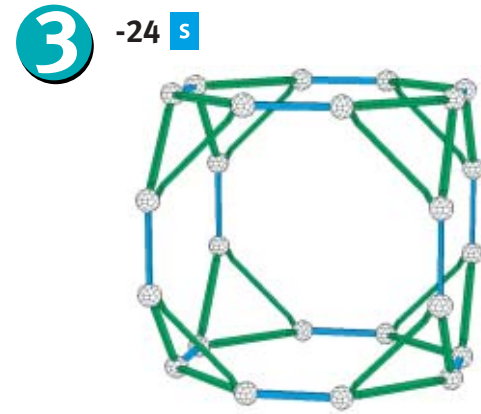
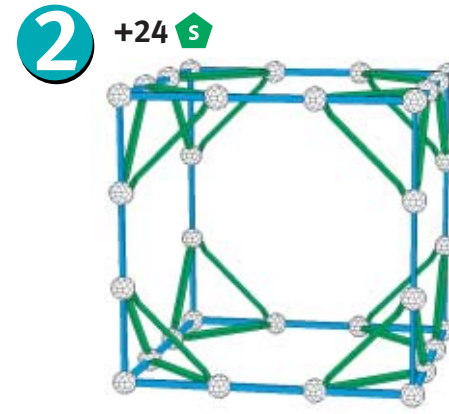
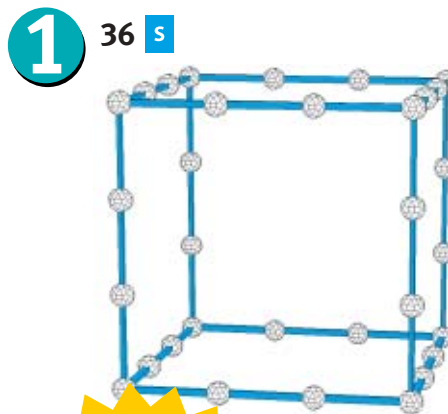
Truncated Cube

Chapter 3, Challenge 3.4

Begin by building a cube with 36 short blues, 3 to an edge (1).

Add 24 short greens to “slice” the corners of the cube (2).

Finally, remove the corners to reveal the complete Truncated Cube (3).



IMPORTANT!
For best results, YOU MUST MAKE EACH CONNECTION VERY TIGHT as you proceed!

Truncated Octahedron

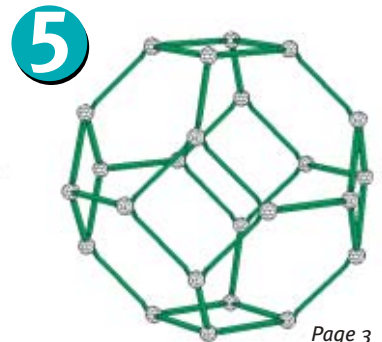
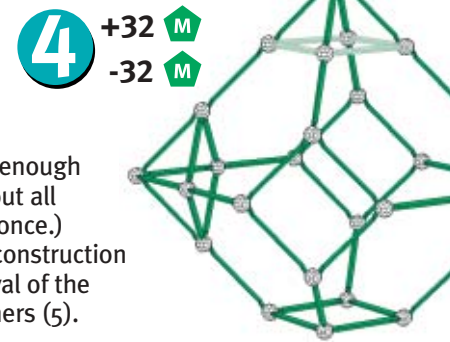
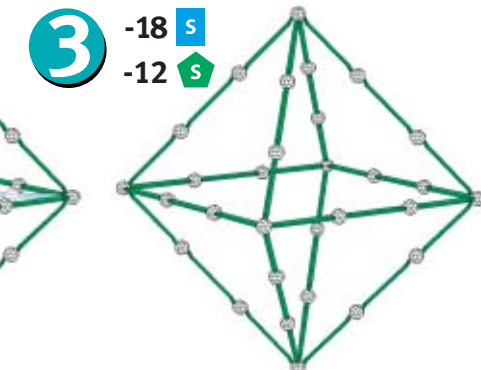
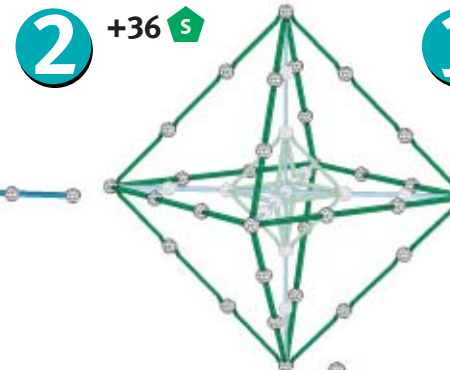
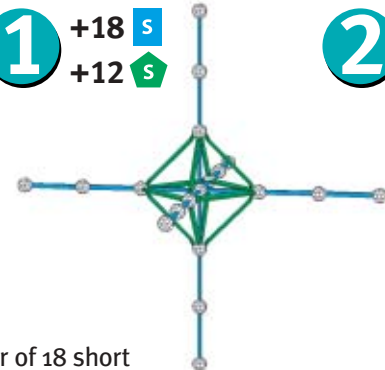
Chapter 3, Challenge 3.4

Build a temporary stabilizer of 18 short blues and 12 short greens, as shown (1).

Build a regular Octahedron around the stabilizer (2).

Remove the stabilizer (3).

Now, *one corner at a time*, connect “slices” through the 8 corners with 32 additional short greens (4). As you complete each slice, you must remove the 4 greens from the corner to create the next slice.



(There are not enough greens to cut out all the corners at once.) Complete the construction with the removal of the last of the corners (5).

How do GreenLines expand the Zome System from 31 to 61 lines in space?

Blue, Yellow and Red lines form 31 lines in space. They are based on the Cube, Dodecahedron and Icosahedron — 3 of the 5 Platonic Solids. GreenLines build the other 2 — the Tetrahedron and Octahedron. GreenLines provide the 6 diagonals of a cube — the 6 edges of a Tetrahedron. And 5 different cubes are associated with a Dodecahedron, so GreenLines provide $6 \times 5 = 30$ new lines in Zome System — for a total of 61 lines in space! (See the 5 Tetras construction on page 6.)



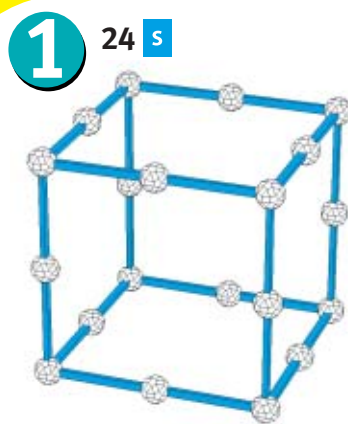
These are the 5 different GreenLines that fit in one pentagonal hole.

Compound of Cuboctahedron and Rhombic Dodecahedron

Chapter 12, Explorations 12B

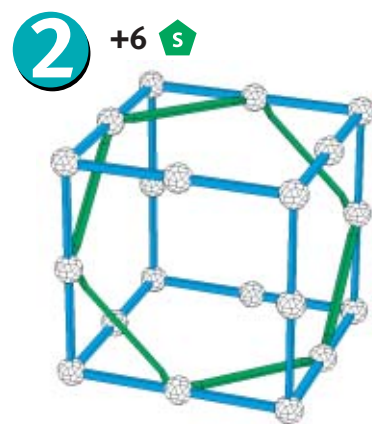
Begin by building a cube with 48 short blues, 4 to an edge. You must stabilize the cube by adding short greens as you go, as indicated (1).

Continue connecting the 12 cube edges at their centers to create the Cuboctahedron (2), then remove the cube to reveal the Cuboctahedron alone (3).



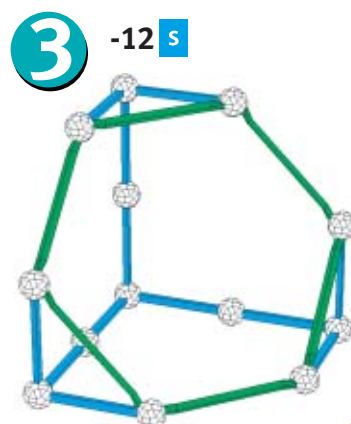
1 24 s
Hexagonal Slice through a Double-size Cube

Chapter 3, Challenge 3.1.5



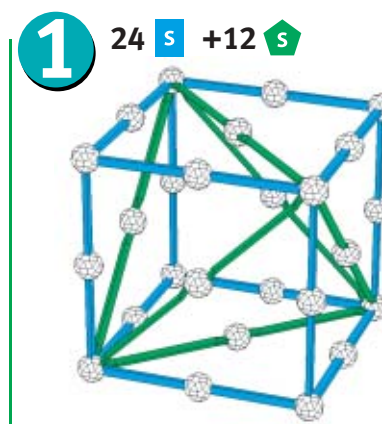
2 +6 s
Begin by building a cube with 24 short blues, 2 to an edge (1). Connect 6 short greens to “slice” through the cube, as shown (2).

Chapter 3, Challenge 3.1.5



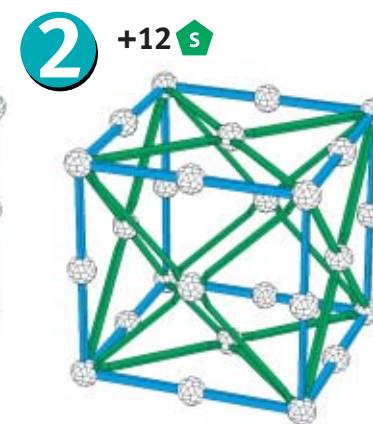
3 -12 s
Finally, remove 12 short blues to take half of the cube away, revealing the Truncated Cube (3).

!
IMPORTANT!
For best results, YOU MUST MAKE EACH CONNECTION VERY TIGHT as you proceed!

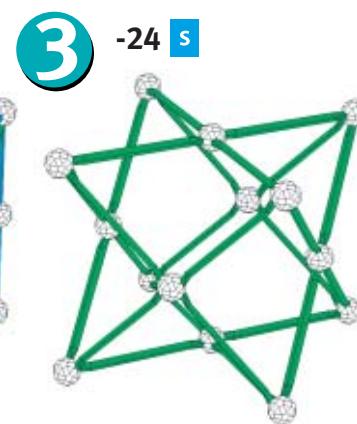


1 24 s +12 s
Stella Octangula in a Cube

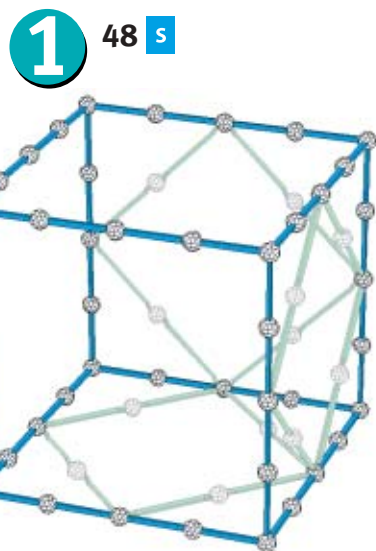
Chapter 3, Challenge 3.2.3



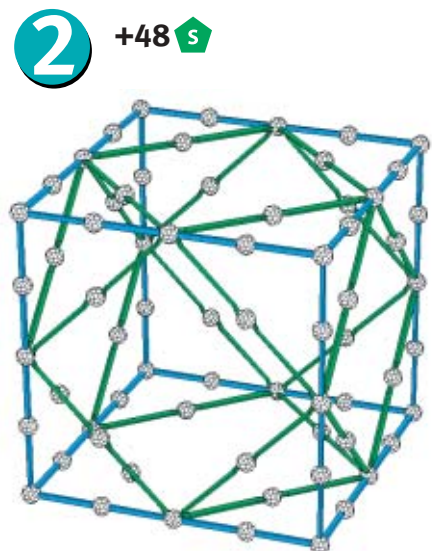
2 +12 s
Begin by building a cube with 24 short blues, 2 to an edge. Connect 4 corners to complete a Tetrahedron, as shown (1).



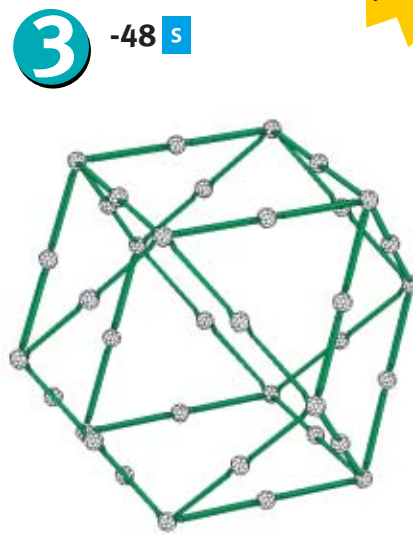
3 -24 s
Complete a second Tetrahedron inside the cube (2), then remove the original cube, to reveal the Stella Octangula (3).



1 48 s
Begin by building a cube with 48 short blues, 4 to an edge. You must stabilize the cube by adding short greens as you go, as indicated (1).



2 +48 s
Continue connecting the 12 cube edges at their centers to create the Cuboctahedron (2), then remove the cube to reveal the Cuboctahedron alone (3).



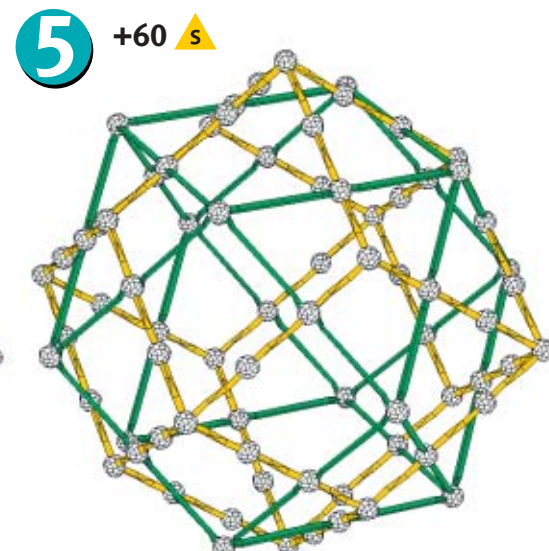
3 -48 s
Continue connecting the 12 cube edges at their centers to create the Cuboctahedron (2), then remove the cube to reveal the Cuboctahedron alone (3).

Notice that 2 triangles and 2 squares come together at every vertex. Choose one. Build a single yellow rhombus that connects the midpoints of the edges (4) of the triangles and squares that meet at that vertex, as shown.

Continue to connect rhombuses around each vertex to complete the Rhombic Dodecahedron (5).



4 +12 s
Notice that 2 triangles and 2 squares come together at every vertex. Choose one. Build a single yellow rhombus that connects the midpoints of the edges (4) of the triangles and squares that meet at that vertex, as shown.



5 +60 s
Continue to connect rhombuses around each vertex to complete the Rhombic Dodecahedron (5).

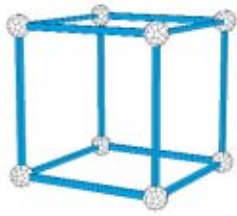
Five Tetrahedra in a Dodecahedron

Chapter 11,
Challenge 11.3

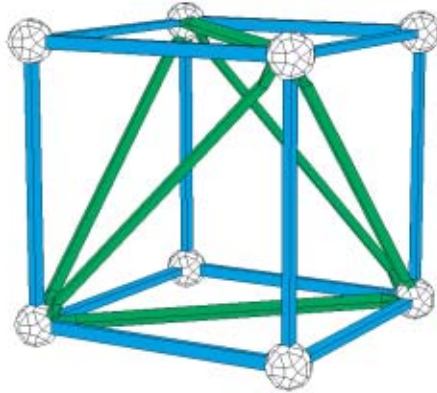
First, build a cube using 12 medium blues (1).

Now insert 6 medium greens along the diagonals of 6 faces, as shown, to create the first Tetrahedron inside the cube (2).

1 12 M



2 +6 M



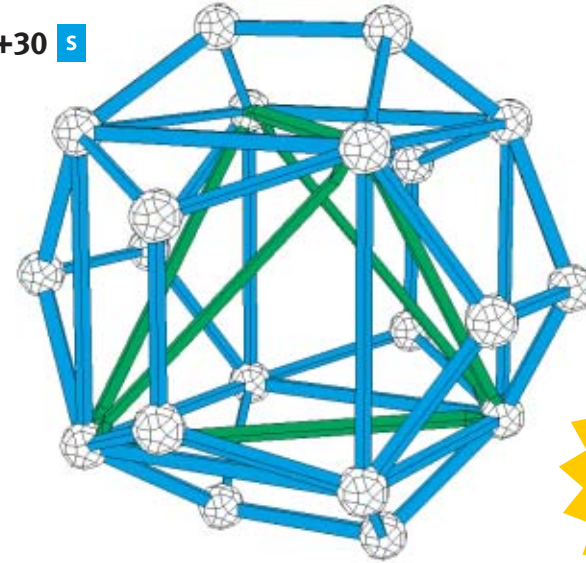
Now construct a Dodecahedron around the cube using 30 short blues (3).

Remove the original cube from inside the Dodecahedron (4).

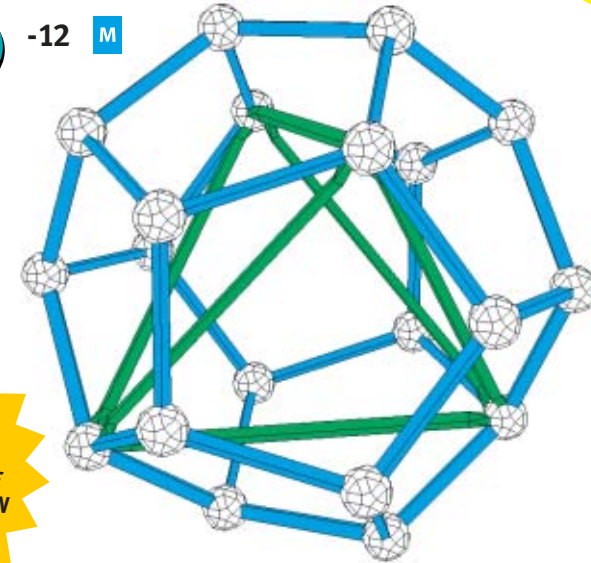
In steps 5 through 7, add 3 more Tetrahedra. To clarify these additions, the new pieces for each step are shown solid, with the previous construction shown as a ghost. The complete solid image for each step is shown as an inset (5 - 7).

Finally, place the fifth Tetrahedron (8) to complete the model (9)!

3 +30 S

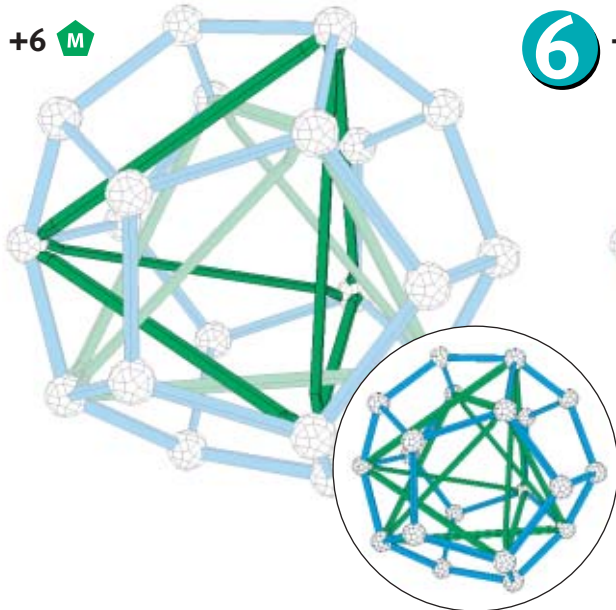


4 -12 M

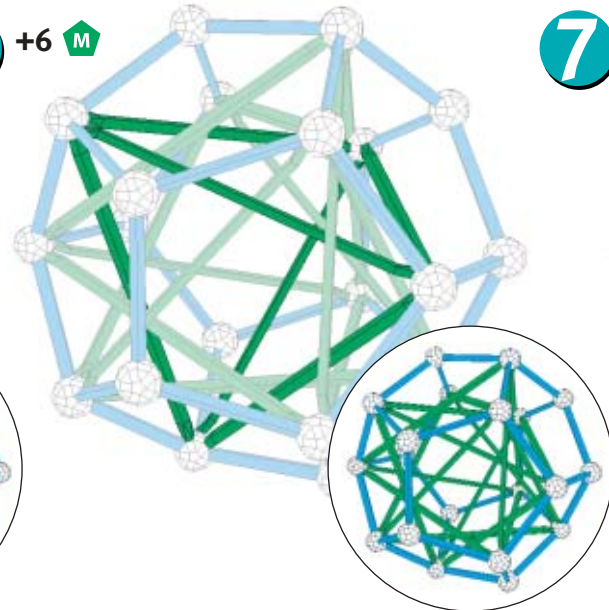


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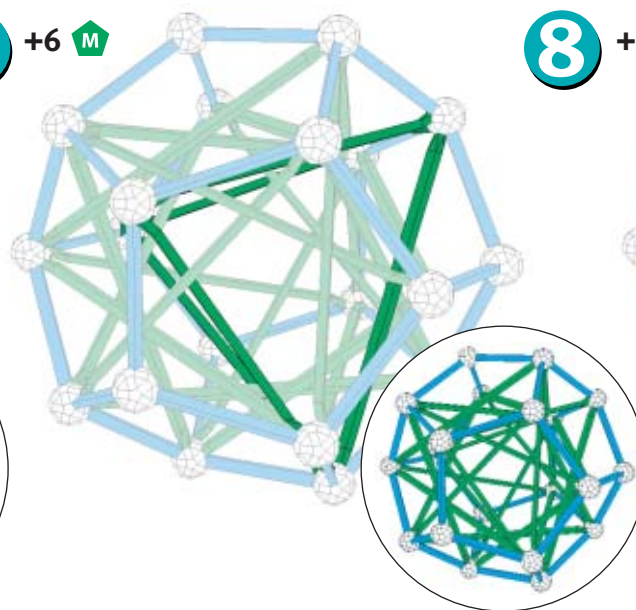
5 +6 M



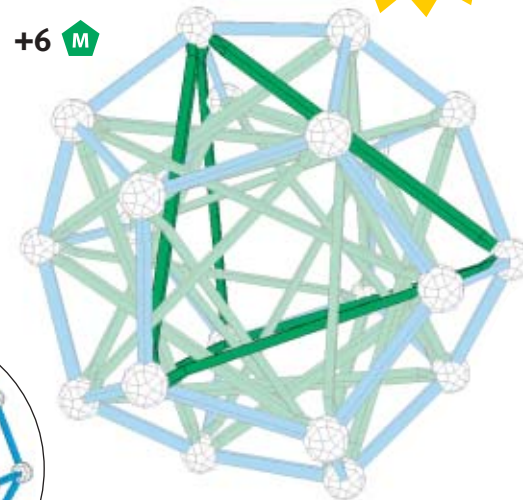
6 +6 M



7 +6 M



8 +6 M



9

