

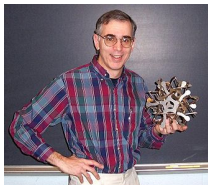
Geometric Sculpture

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- 1 The Sculptures
- 2 Symmetry is Important
- 3 Icosahedral Symmetry
- 4 Problem Solving Process

George Hart-Mathematical Artist



The more math you know,
the more stuff you can make. -George Hart

Geometric Sculpture

Elephants



Mosaic Orb



One more thing to climb

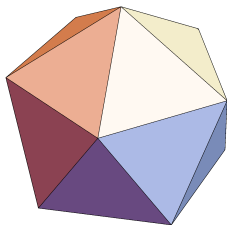


Frabjic

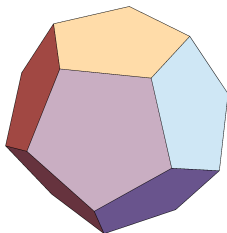


What are the possible rotational symmetries of these polyhedra?

Icosahedron

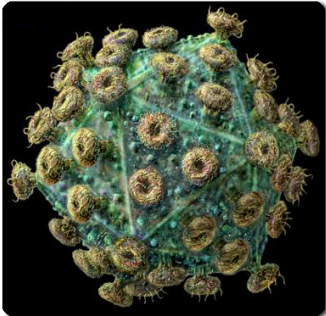


Dodecahedron

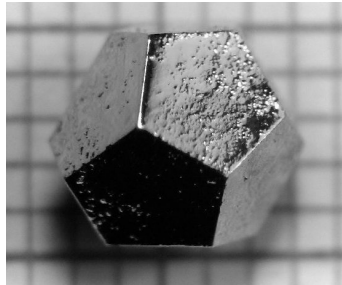


Icosahedra and Dodecahedra in the world

Virus



Quasicrystal



What is symmetry?

A thing is symmetrical if there is something you can do to it so that after you have finished doing it, it looks the same as before.
-Hermann Weyl

Spatial Symmetry

Definition

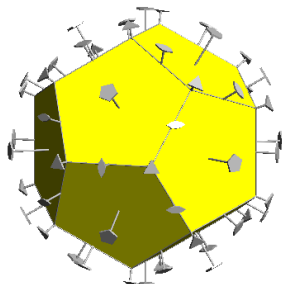
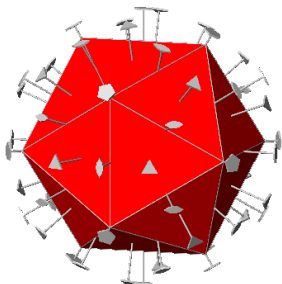
A symmetry of a solid object in space is a rigid motion of space that leaves the object apparently unchanged.

Fivefold Rotational Symmetry

Threefold Rotational Symmetry

Twofold Rotational Symmetry

Axes of Symmetry



31 axes and 60 total symmetries!

Problem Solving Process

- At first there are a bunch of pieces and you don't really know how they fit together
- You look for patterns or relationships between the pieces
- As you figure out how to put some of the pieces together more patterns emerge
- Before you know it, the problem is solved

Thank you!

Hope you had a fun time building!

- georgehart.com
- Senechal, Marjorie Crystalline Symmetries
- Weyl, Hermann Symmetry