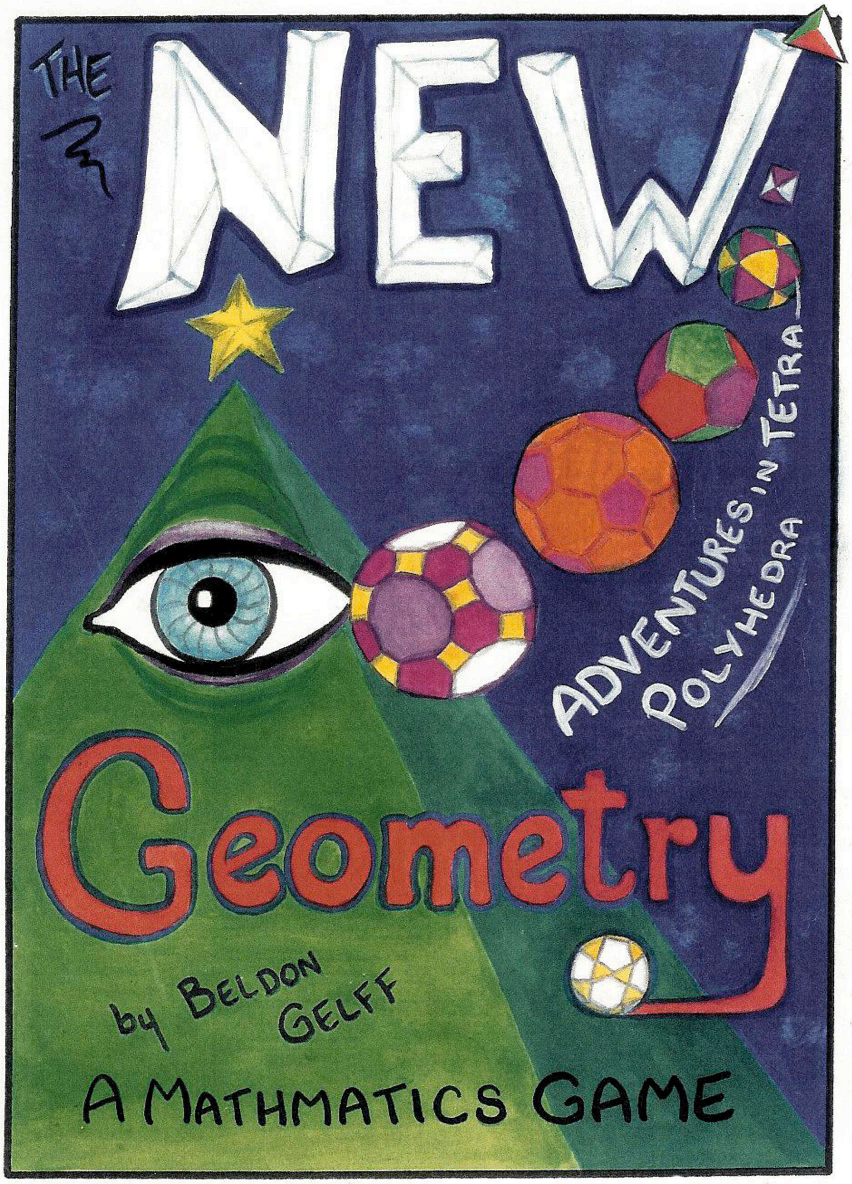


$6 For A New World

Cell Phone 831 747-7252

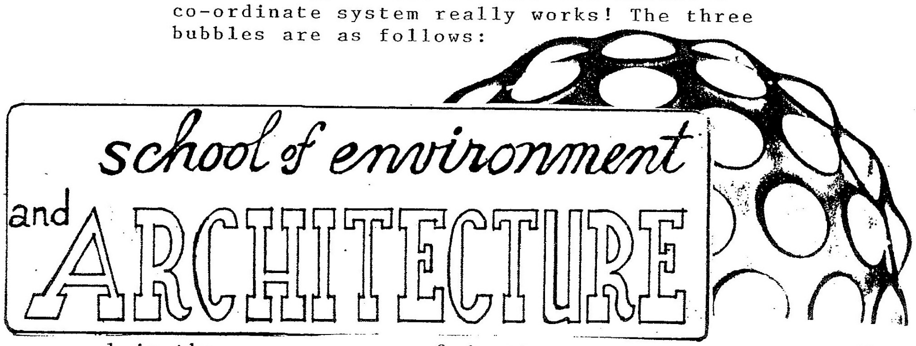
MATHEMATICS the GAME

Exploring Polyhedra

Beldon Gelff

Adventures of Polyhedra

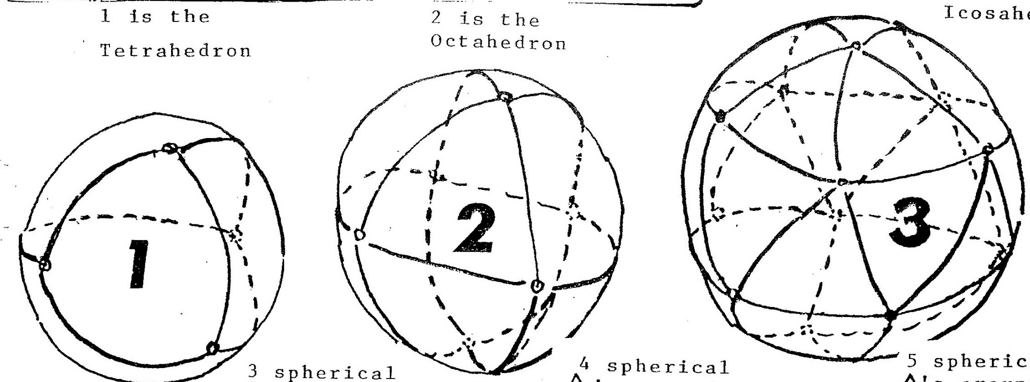
This channelling is designed to stimulate the interaction between children and adults in the world of mathematics and geometry. The first assumption to be made is that the phenomena we are describing can be modeled with 3-dimentional illustrations or material models. So now we are working with number, pattern, arts and crafts. Therefore numbers will not be used as an abstract form but as a tool to produce useful and beautiful projects leading the user into greater and greater awareness of matter's fundamental patterning. We will start our game with three bubbles and account the topology of each to see how nature's co-ordinate system really works! The three bubbles are as follows:



1 is the Tetrahedron

2 is the Octahedron

3 is the Icosahedron



3 spherical △'s around each vertex

4 spherical △'s around each vertex

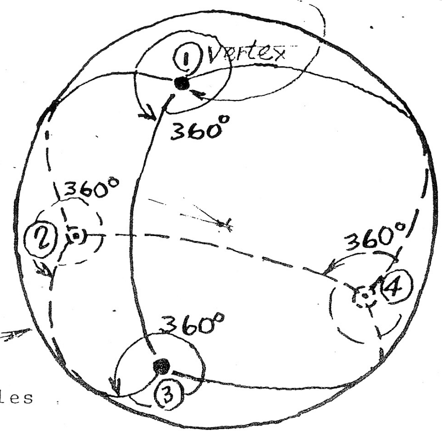
5 spherical △'s around each vertex

1 the Tetrahedron

3 spherical Δs
around each Vertex
there are 4 verticie

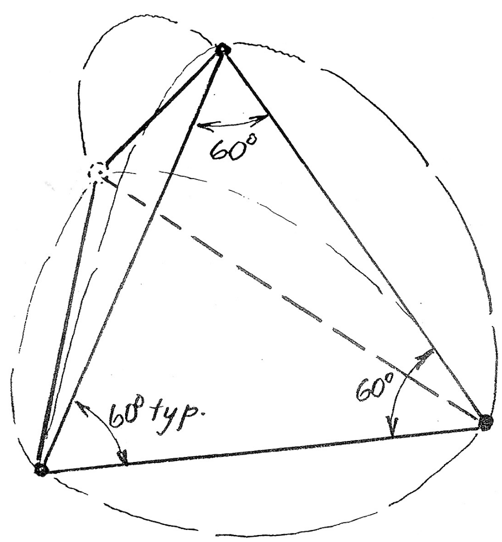
each vertex has
360° with 4
verticies total=
1440°

SPHERICAL
TETRAHEDRON



Composed of 4 spherical triangles

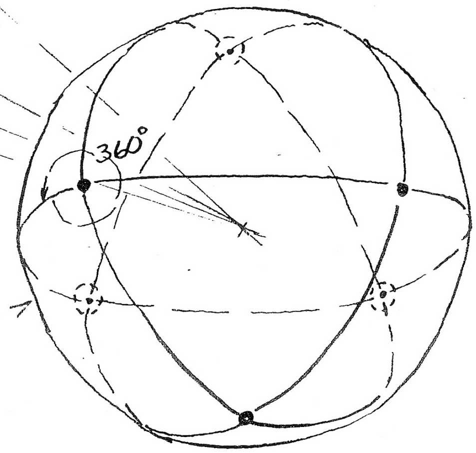
now with the
sphere cut away
so we have a
planar tetrahedron
made up of 4-60°
Δs, each having
180°. The Four
Δs = 720°
<u>The tetrahedron</u>
<u>equals 720°</u>



Now let's
find what
we call the spherical excess which is the
difference between the spherical tetrahedron and
the planar tetrahedron or 1440° minus 720° equals 720°
the equivalent of <u>one</u> <u>tetrahedron</u> numerically.

2 the Octahedron

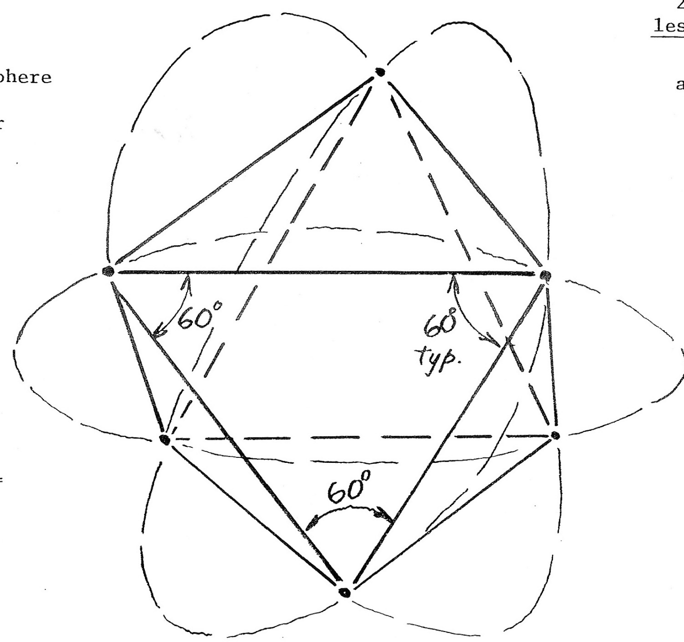
each vertex has
360° with 6 verticies,
Total= 2160°.



SPHERICAL OCTAHEDRON

The whole system
is composed of
8 spherical triangles.
4 spherical Δ's around
each vertex.

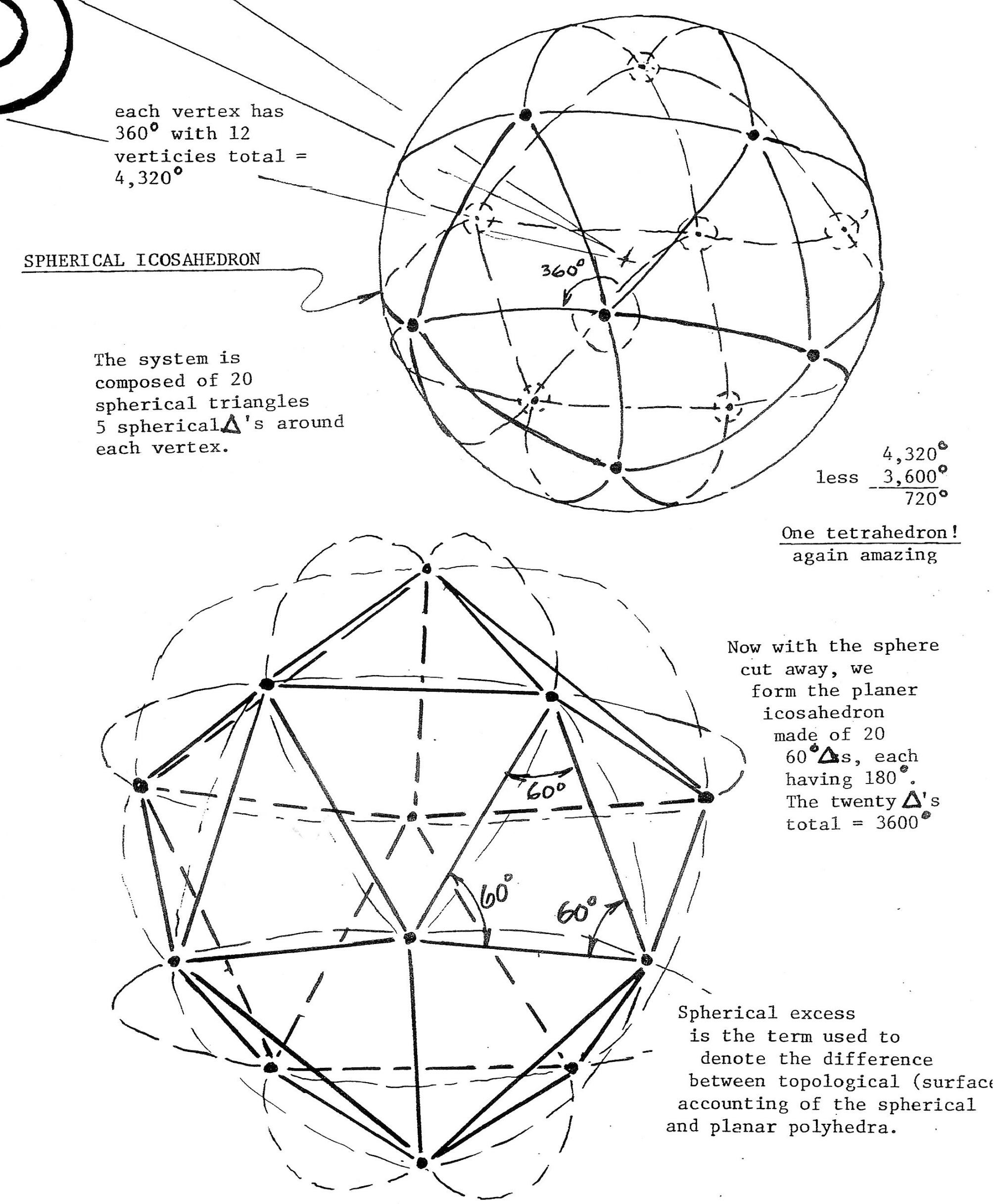
Now with the sphere
cut away we
form the planar
octahedron
made of 8
60°Δs each
having 180°.
The eight
Δs = 1440°



2160°
less 1440°
720°
again the
spherical
excess
is 720°
or one
Tetrahedron

The octahedron =
1440

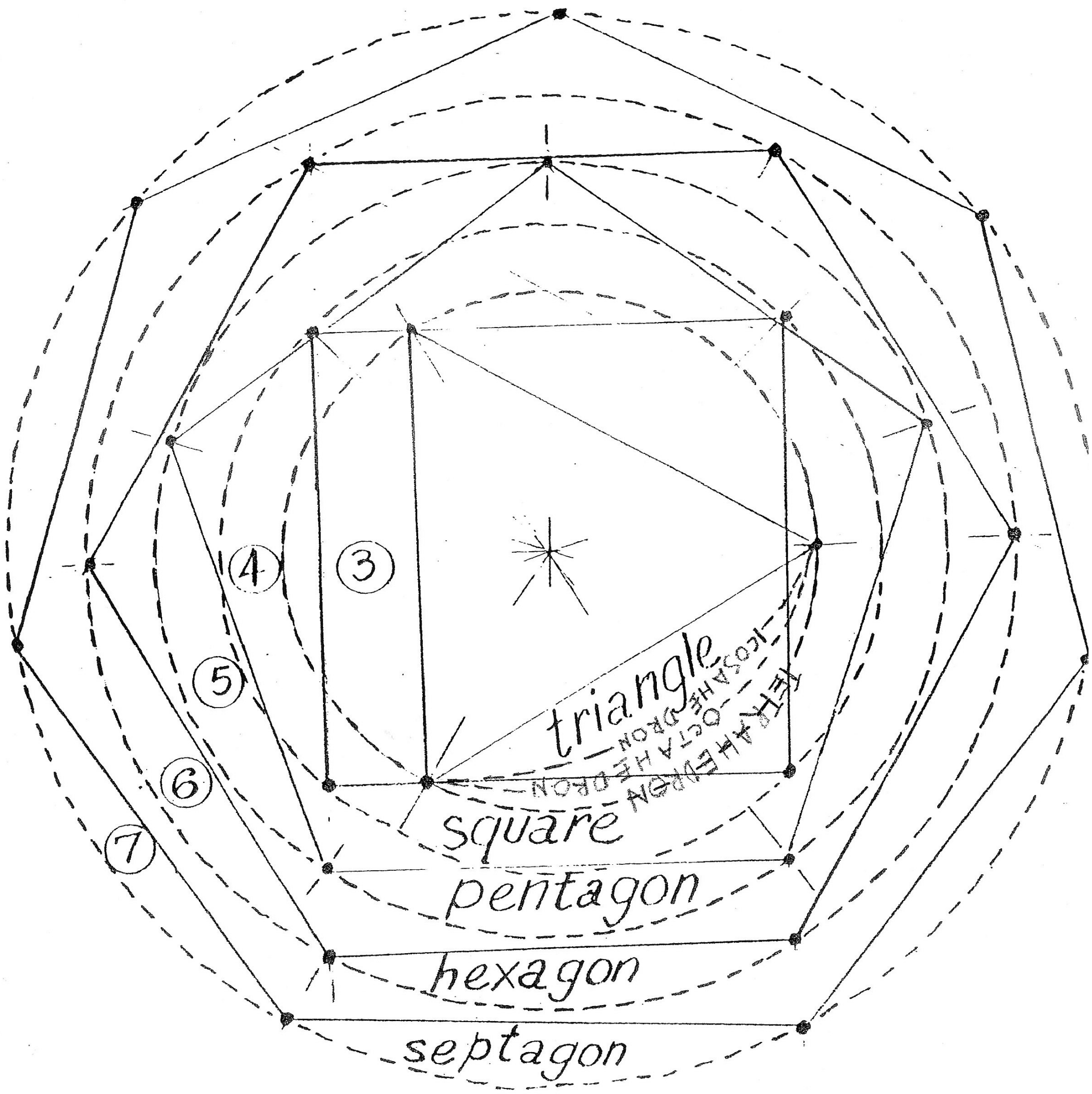
3 the Icosahedron



IN ALL POLYHEDRA THE SPHERICAL EXCESS ALWAYS EQUALS 720°, ONE TETRAHEDRON

TRULY AMAZING!

SCIENTIFIC TEACHING SYSTEM



BASIC POLYGON GRID SYSTEM

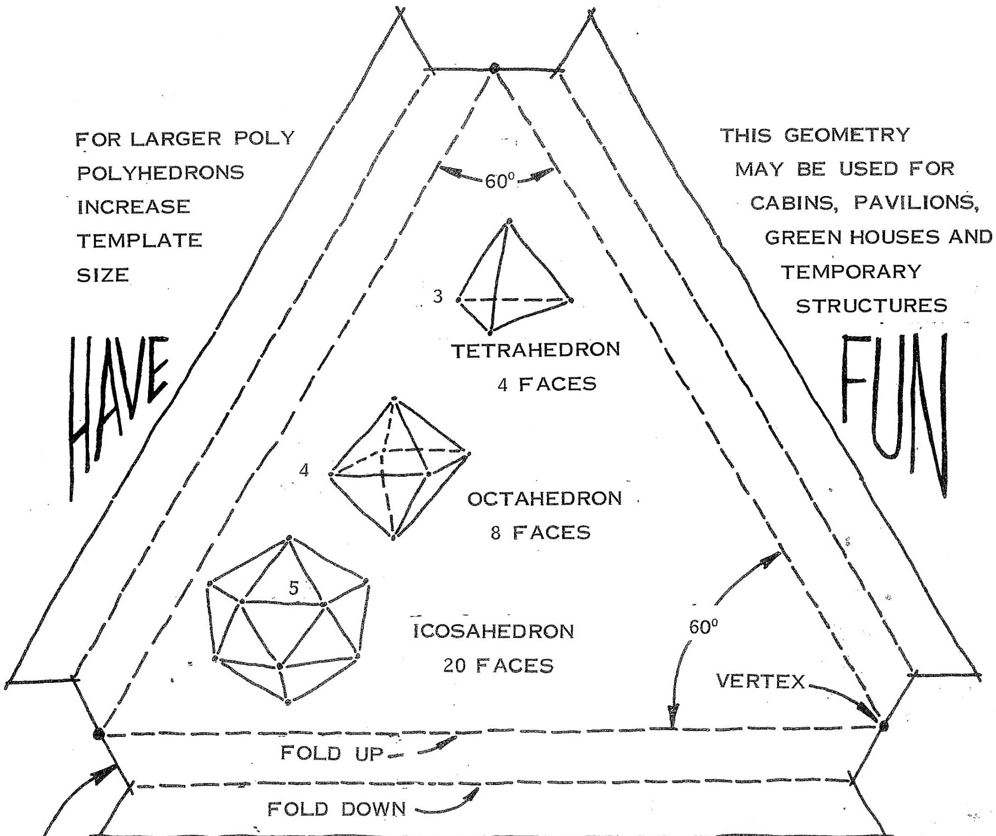
each polygon having COMMON edge lengths

TRIANGLE — 2 FACES AROUND EACH VERTEX

TETRAHEDRON — 3 FACES AROUND EACH VERTEX

OCTAHEDRON — 4 FACES AROUND EACH VERTEX

ICOSAHEDRON — 5 FACES AROUND EACH VERTEX



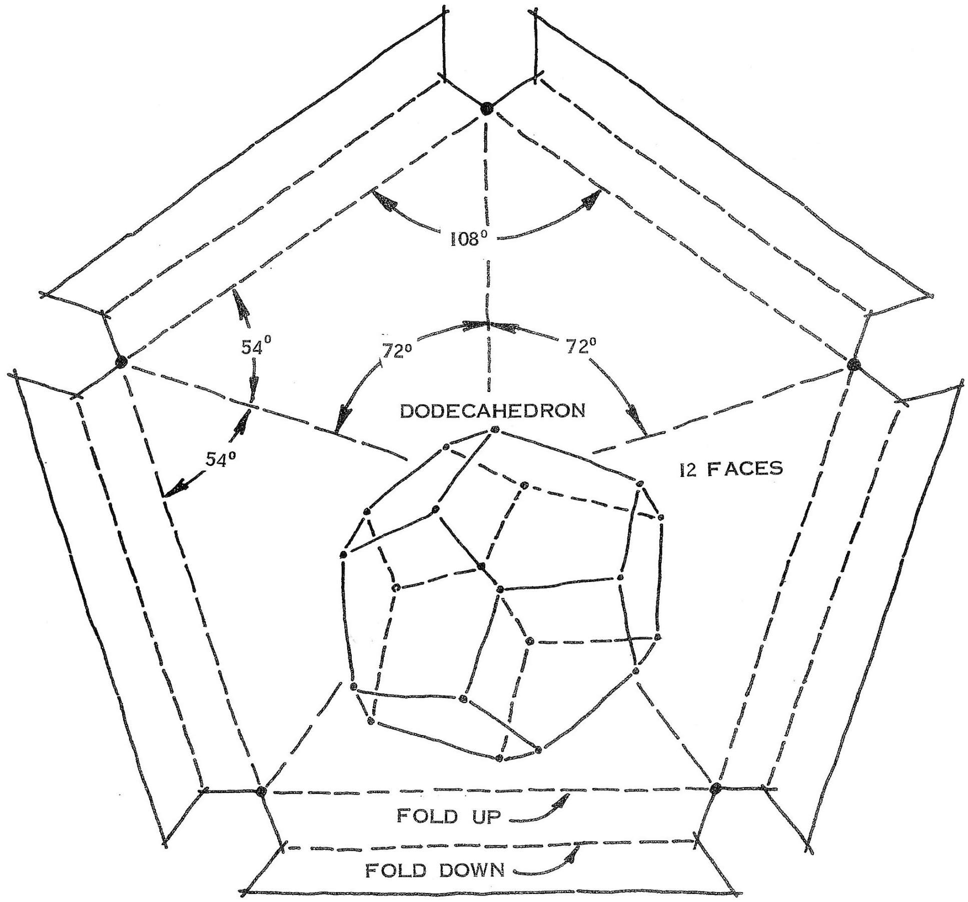
STAPLE TO ADJACENT TRIANGLE

CUT OUT AND USE AS TEMPLATE. COLOR DESIGNS AND MESSAGES WITH FELT-TIP PENS. MAKE ORNAMENTAL LANTERNS. BELDON GELFF, DESIGNER.

JUNE 1968

PENTAGON

DODECAHEDRON — 3 FACES AROUND EACH VERTEX

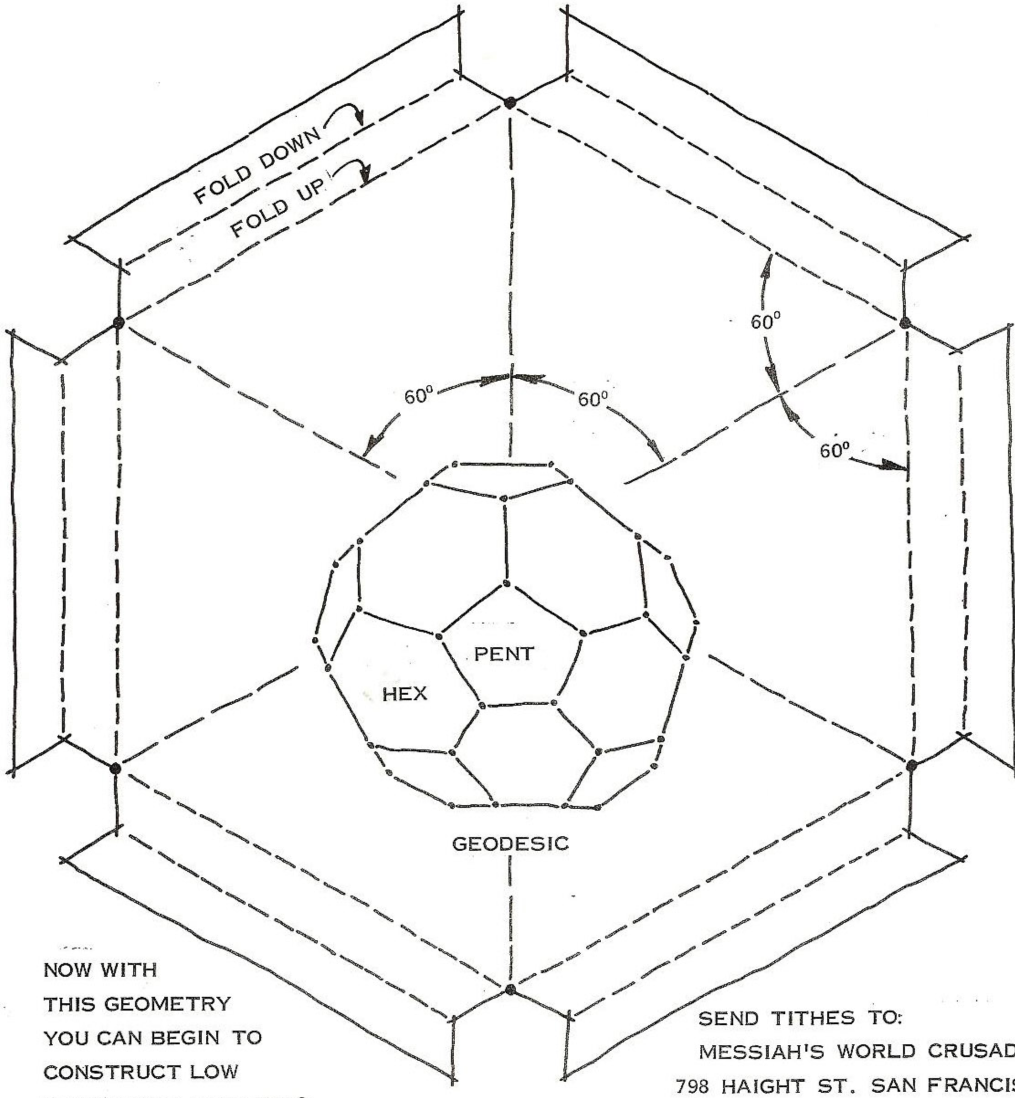


COMBINE THE PENTAGON WITH THE TRIANGLE OR HEXAGON AND DISCOVER NEW SHAPES!
NOTE THAT A COMMON EDGE LENGTH MUST BE USED WHEN FACES ARE USED IN COMBINATION!

BELDON GELFF, DESIGNER
JUNE 1968

HEXAGON

HEX — PENT GEODESIC — 12 PENTAGONAL FACES AND 20 HEXAGONAL FACES



NOW WITH THIS GEOMETRY YOU CAN BEGIN TO CONSTRUCT LOW FREQUENCY GEODESIC SPHERES.

SEND TITHES TO:
MESSIAH'S WORLD CRUSADE
798 HAIGHT ST. SAN FRANCISCO

HELP BEGIN THE CRUSADE THAT WILL LEAD TO BUILDING THE NEW AGE.

BELDON GELFF, DESIGNER

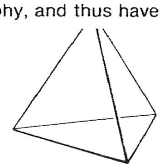
Adventures of polyhedra

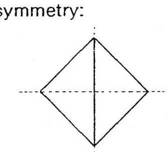
after U have read the preceding
4 pages go to the BASIC POLYGON
GRID SYSTEM with common length edges
PICK the POLYHEDRON that U would like to Construct,
cut out the necessary number of triangles, squares,
pentagons or hexagons required for your selection
and enjoy the process of actually constructing some thing
real with mathematics and geometric polygons. U-R now mathematically
co-ordinate!

Regular polyhedra are uniform and have faces of all of one kind of congruent regular polygon. There are five regular polyhedra. The regular polyhedra were an important part of Plato's natural philosophy, and thus have come to be called the Platonic Solids.

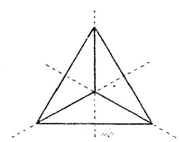
TETRAHEDRON

Faces:
4 triangles
Vertices:
4, each with 3 edges meeting
Edges:
6
Dihedral angle:
70°32′
Views of symmetry:



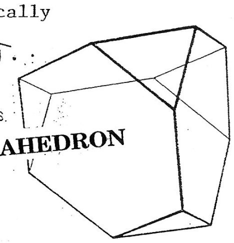


2-fold (3)

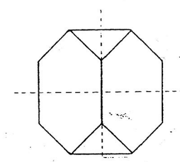


3-fold (4)

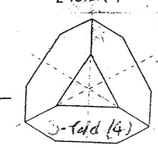
TRUNCATED TETRAHEDRON



Faces:
4 hexagons] 8 total
4 triangles]
Vertices:
12, each with 3 edges meeting
Edges:
18
Dihedral angles:
70°32′ (hexagon-hexagon)
109°28′ (triangle-hexagon)
Views of symmetry:



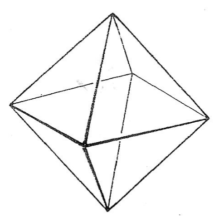
2-fold (3)

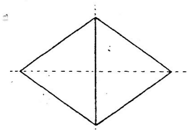


3-fold (4)

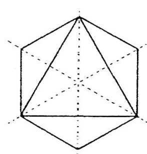
OCTAHEDRON

Faces:
8 triangles
Vertices:
6, each with 4 edges meeting
Edges:
12
Dihedral angle:
109°28′
Views of symmetry:

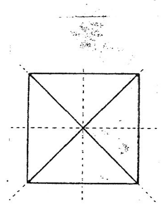




2-fold (6)



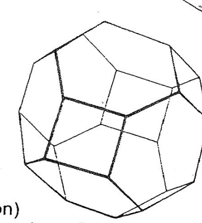
3-fold (4)

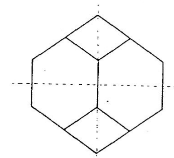


4-fold (3)

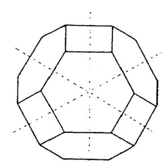
TRUNCATED OCTAHEDRON

Faces:
6 squares] 14 total
8 hexagons]
Vertices:
24, each with 3 edges meeting
Edges:
36
Dihedral angles:
125°16′ (square-hexagon)
109°28′ (hexagon-hexagon)
Views of symmetry:

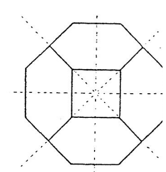




2-fold (6)



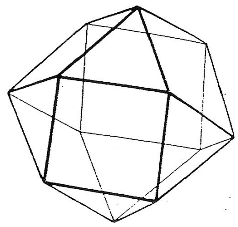
3-fold (4)

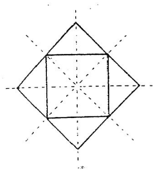


4-fold (3)

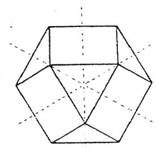
CUBOCTAHEDRON

Faces:
8 triangles, 6 squares — 14 total
Vertices:
12, each with 4 edges meeting
Edges:
24
Dihedral angle:
125° 16′
Views of symmetry:

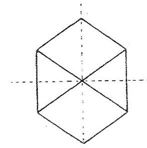




2-fold (6)

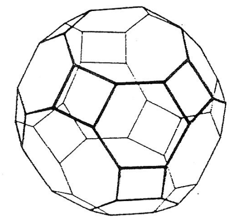


3-fold (4)



4-fold (3)

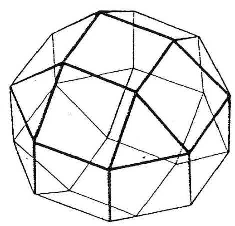
GREAT RHOMBICUBOCTAHEDRON
(Truncated Cuboctahedron)

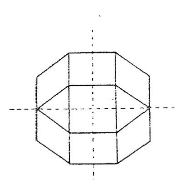


Truncating the cuboctahedron in two different ways gives rise to the truncated cuboctahedron (also known as the greater rhombicuboctahedron) and the rhombicuboctahedron.

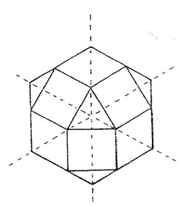
SMALL RHOMBICUBOCTAHEDRON
(Rhombicuboctahedron)

Faces:
8 triangles, 18 squares — 26 total
Vertices:
24, each with 4 edges meeting
Edges:
48
Dihedral angles:
135° (square-square)
144°44′ (square-triangle)
Views of symmetry:

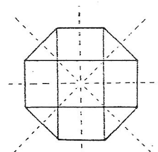




2-fold (6)



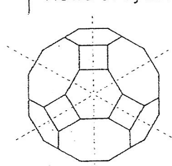
3-fold (4)



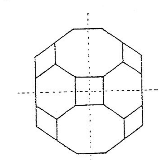
4-fold (3)

Great Rhombicuboctahedron

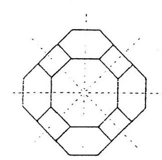
Faces:
12 squares, 8 hexagons, 6 octagons — 26 total
Vertices:
48, each with 3 edges meeting
Edges:
72
Dihedral angles:
135° (octagon-square)
125° 16′ (octagon-hexagon)
144°44′ (hexagon-square)
Views of symmetry:



2-fold (6)



3-fold (4)



4-fold (3)

SNUB CUBE

Faces:
- 32 triangles
- 6 squares

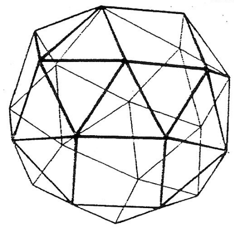
] 38 total

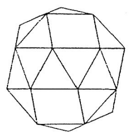
Vertices:
24, each with 5 edges meeting

Edges:
60

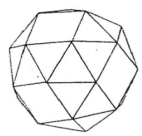
Dihedral angles:
142°59′ (square-triangle)
153°14′ (triangle-triangle)

Views of symmetry:

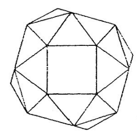




2-fold (6)



3-fold (4)



4-fold (3)

SNUB DODECAHEDRON

Faces:
- 80 triangles
- 12 pentagons

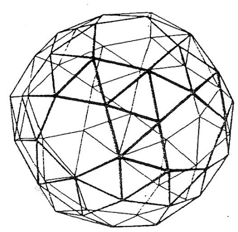
] 92 total

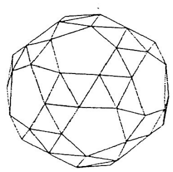
Vertices:
60, each with 5 edges meeting

Edges:
150

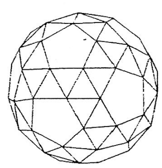
Dihedral angles:
152°16′ (pentagon-triangle)
164°11′ (triangle-triangle)

Views of symmetry:

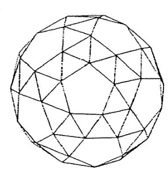




2-fold (15)

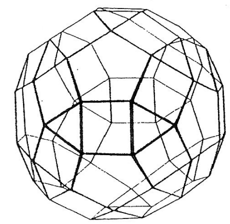


3-fold (10)



5-fold (6)

After completing these polyhedra you are sufficiently tuned into mathematic conceptioning that U now will be able to pick up "Bucky Fuller's Synergetics" and read it with meaning and clarity so that the magic of the "Wizard" will shine thru to reveal what God mind is teaching thru its microcosym instruments.



SMALL RHOMBICOSIDODECAHEDRON
(Rhombicosidodecahedron)

Faces:
- 20 triangles
- 30 squares
- 12 pentagons

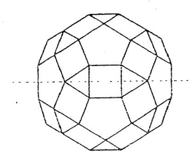
] 62 total

Vertices:
60, each with 4 edges meeting

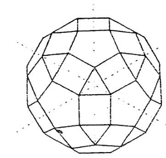
Edges:
120

Dihedral angles:
148°17′ (pentagon-square)
159°6′ (triangle-square)

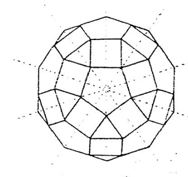
Views of symmetry:



2-fold (15)



3-fold (10)



5-fold (6)