Product Design Project III

“Design of Teaching-Learning Aids for Blind Children”

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Guide : prof. R Sandesh

Design Brief

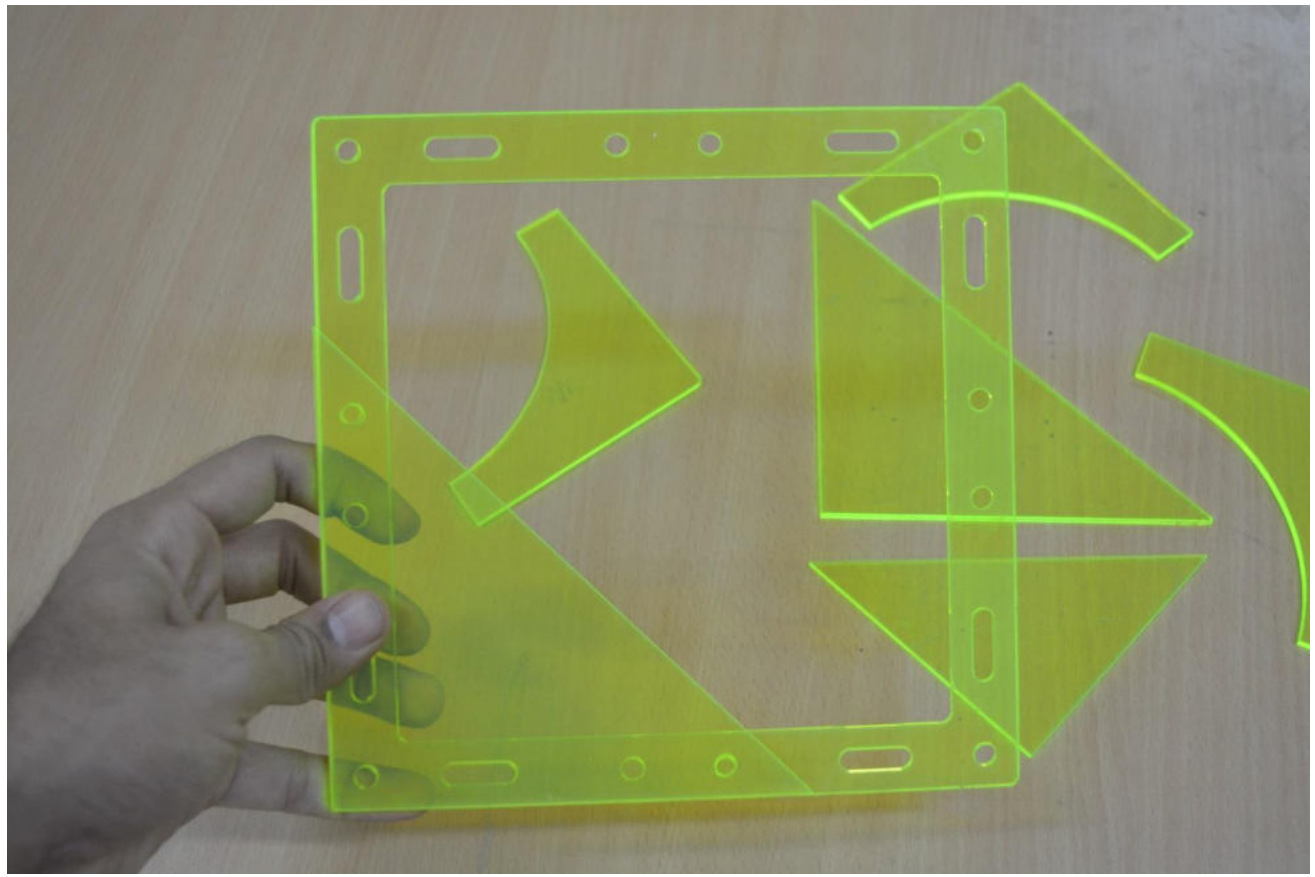
To design/develop Teaching-Learning aids for the concepts of Geometry in Mathematics for the blind children.

The cost should be very low as possible and should be a good value-for-money product.The product is aimed at lower middle class and middle class.
There is no constraint for the materials as long as it will be durable, long-lasting, easy to manufacture and low cost.

Other considerations

i. It should be strong and sturdy so as to withstand the manipulation of the visually impaired child.
ii. As far as possible, sharp edges should be avoided in three-dimensional aids for visually impaired children. Sharp edges may be made blunt to avoid injuries to the Braille reading fingers.

Concepts

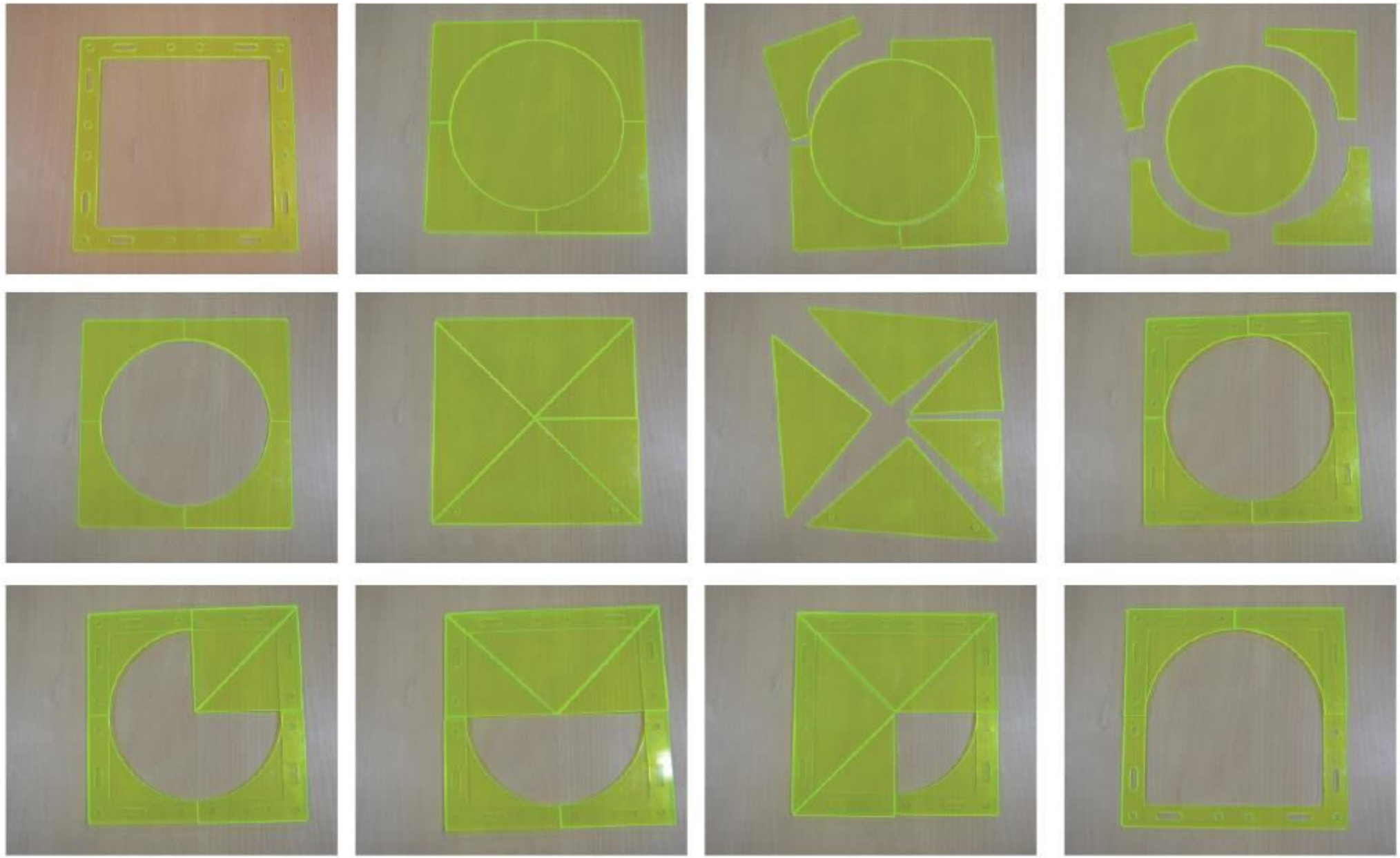


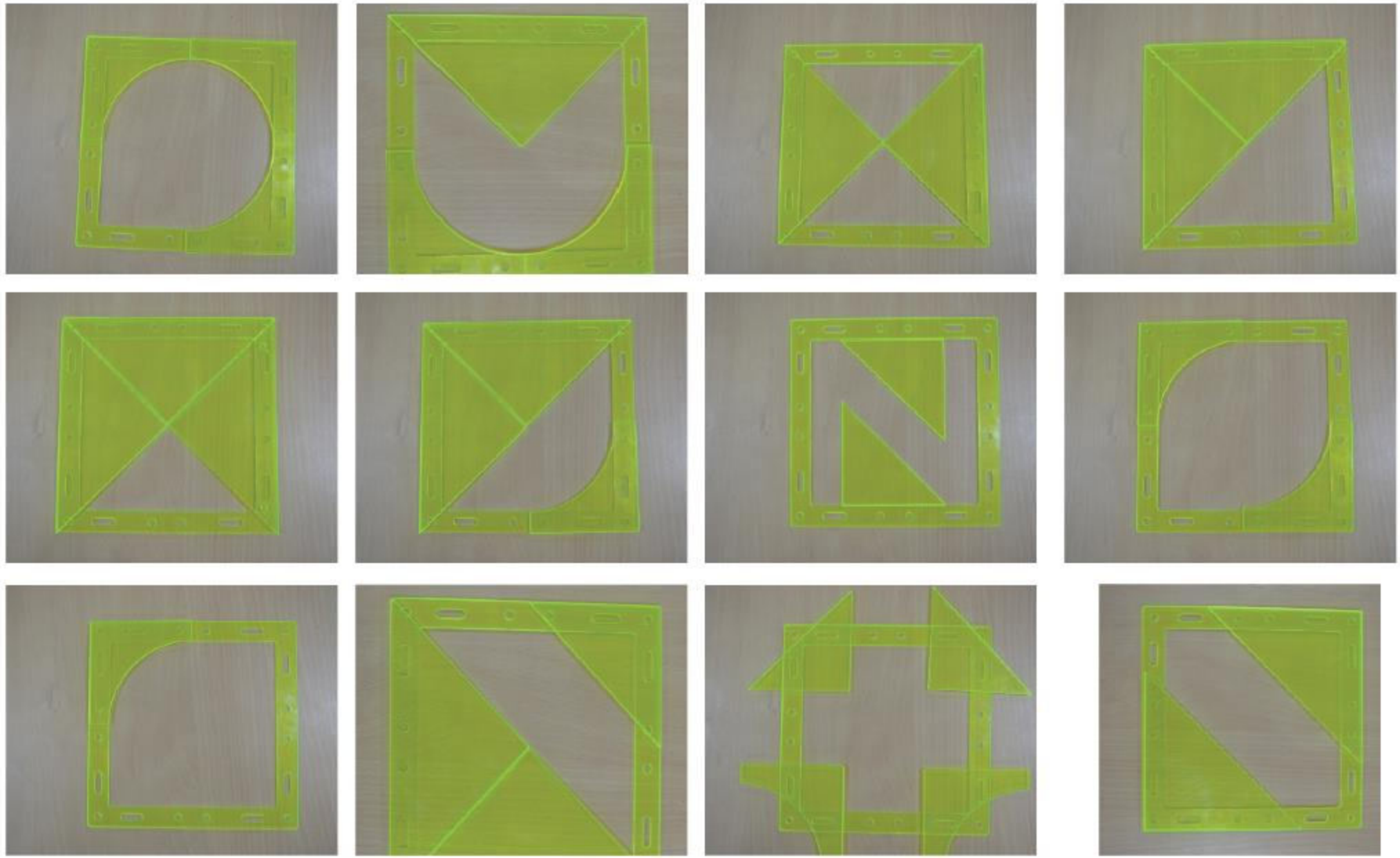
Concept 1

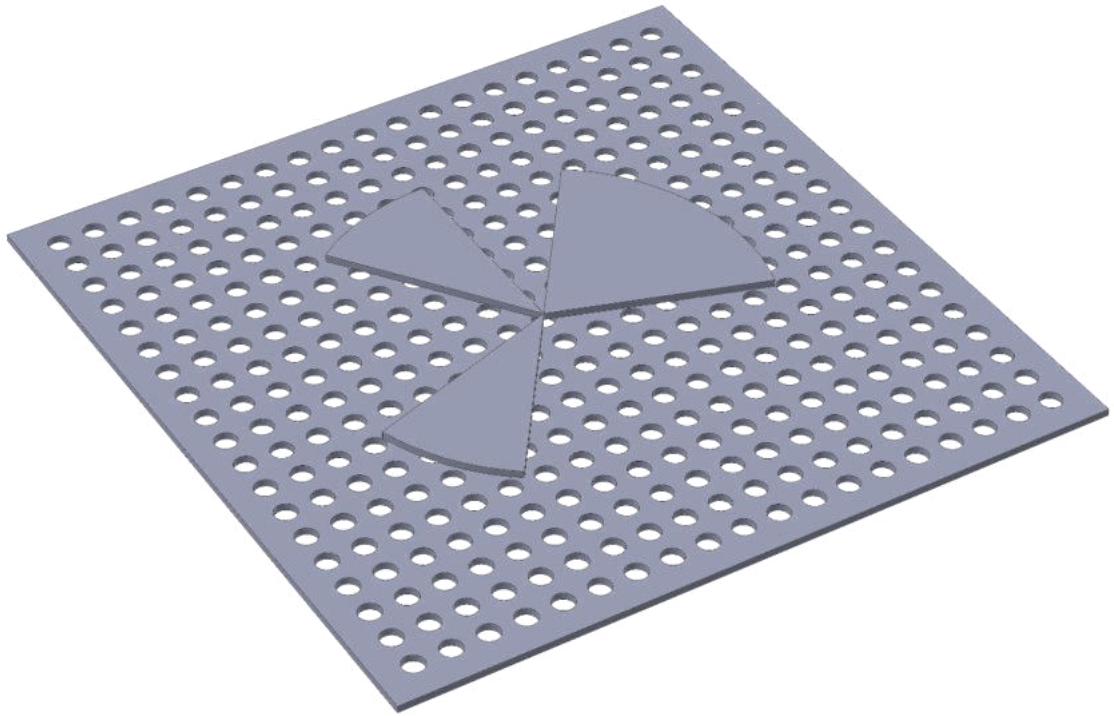
Understanding Elementary Shapes 2-D

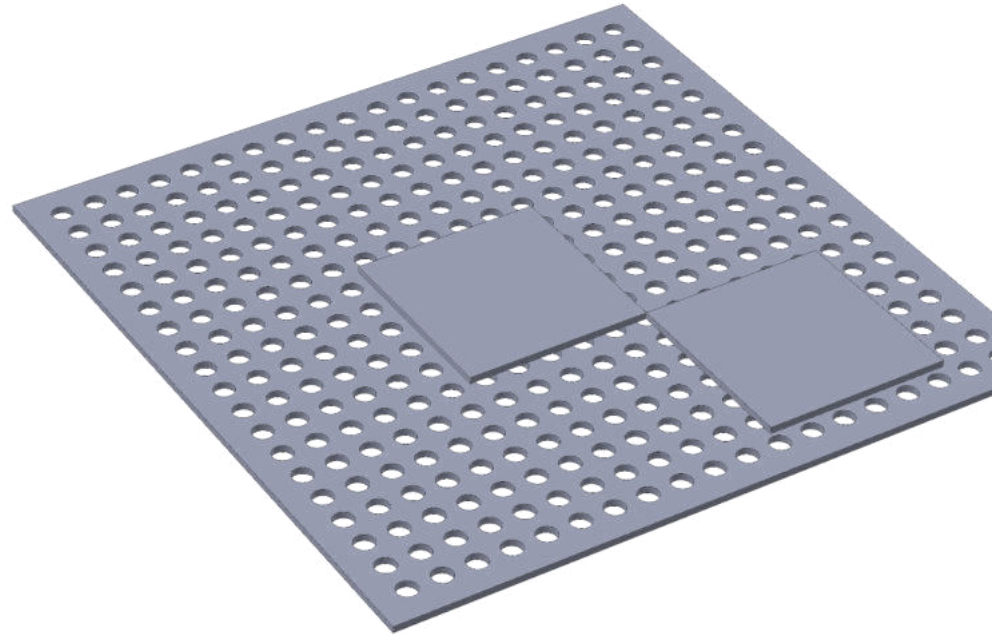
Classification of triangles (on the basis of sides, and of angles)
- Types of quadrilaterals – Trapezium, parallelogram, rectangle, square, rhombus.
- Simple polygons (introduction) (Up-to octagons regulars as well as non regular).

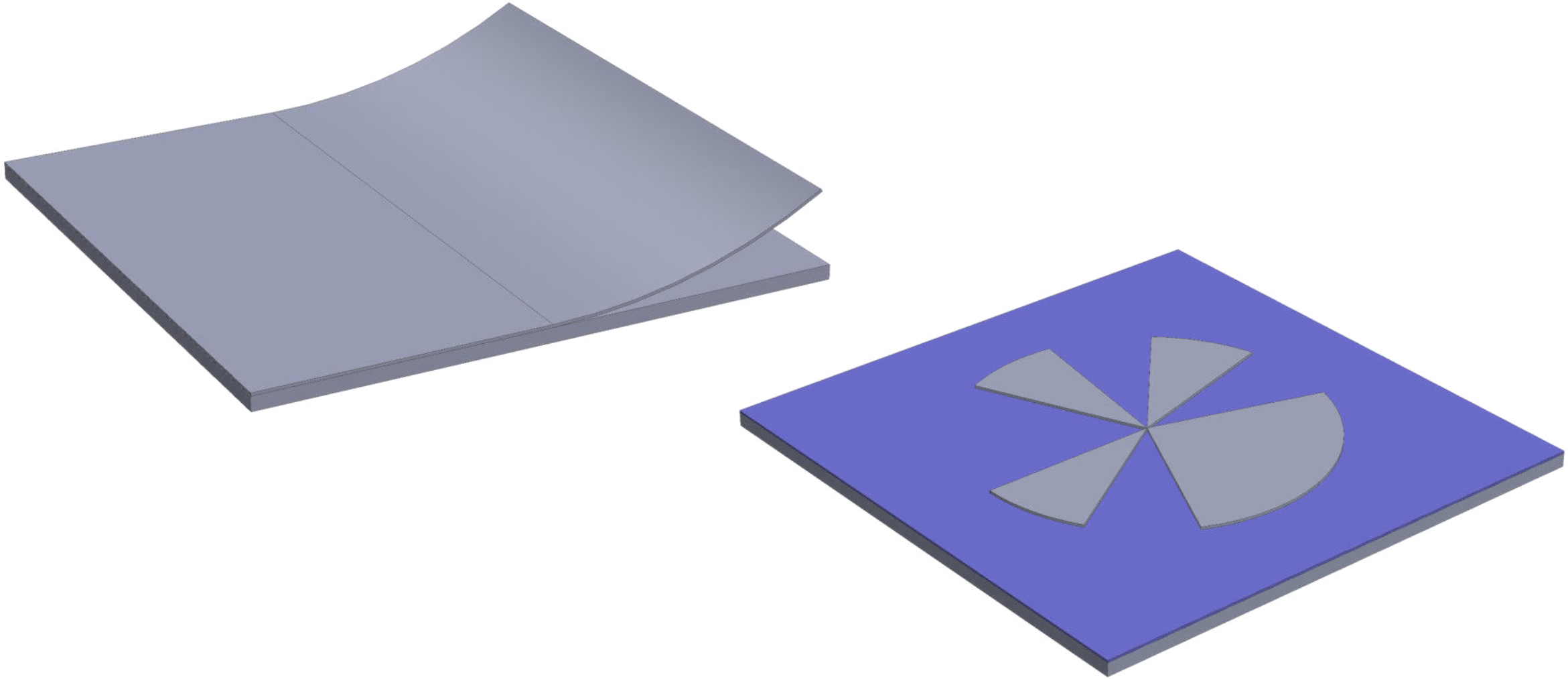
Beginners Geo-frame











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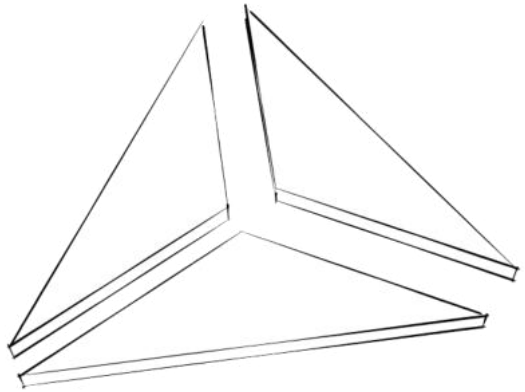

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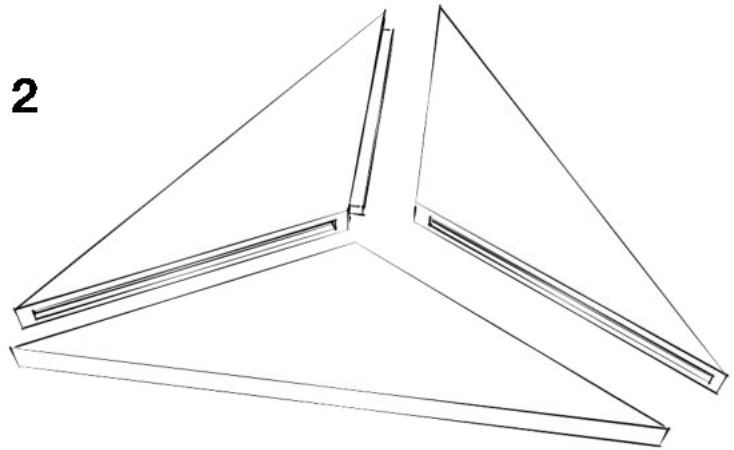

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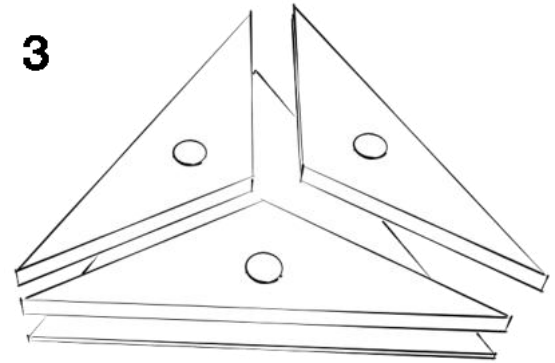

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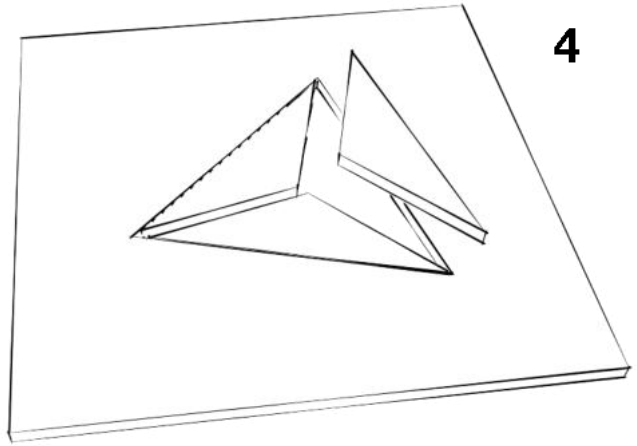

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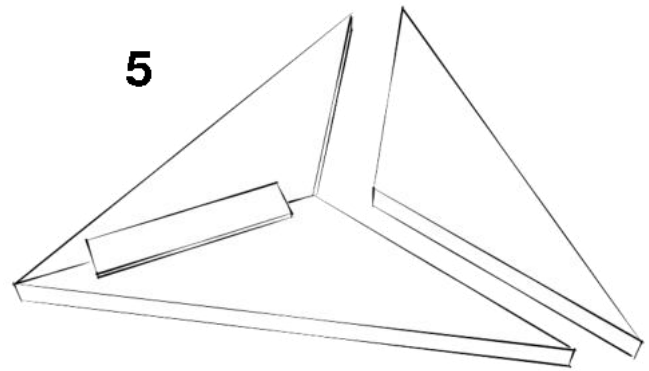

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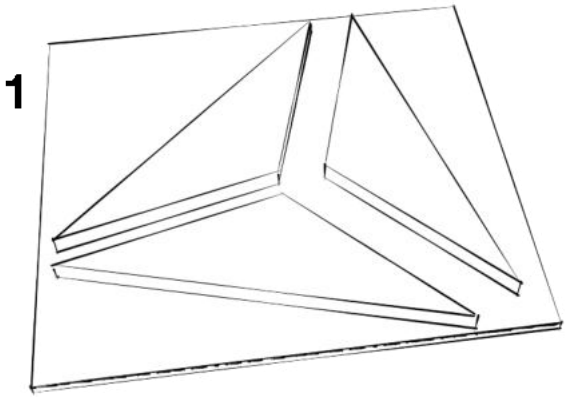

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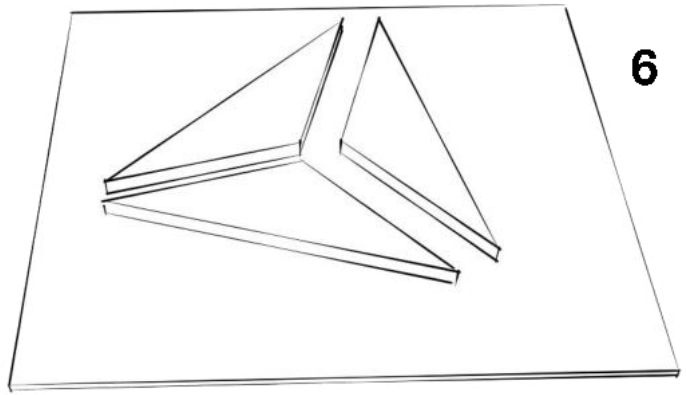

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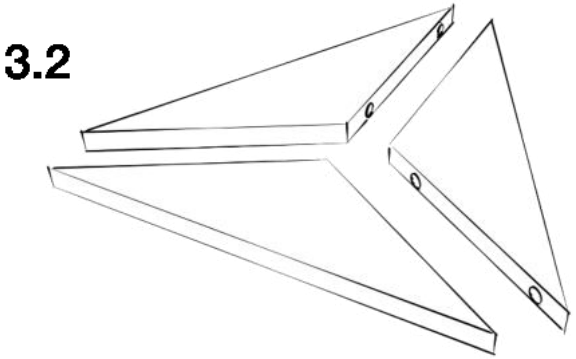
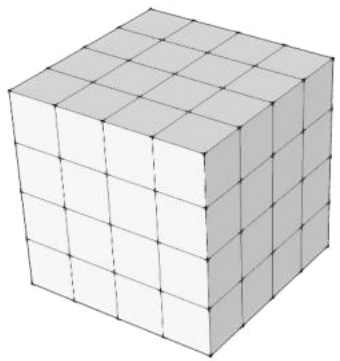
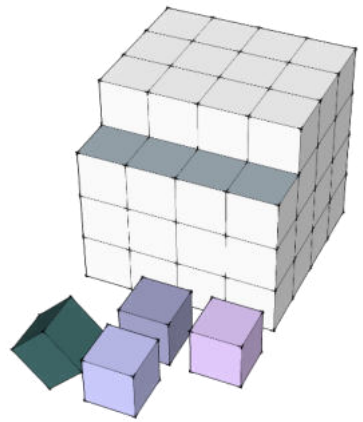
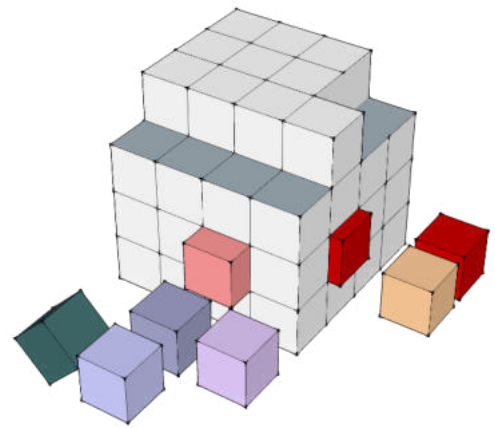
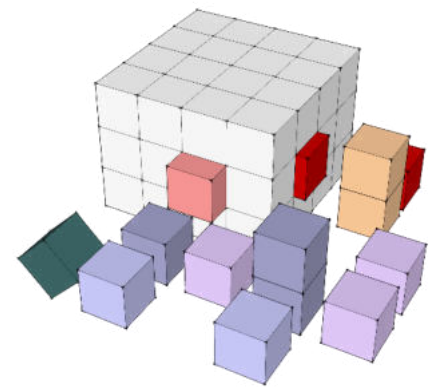


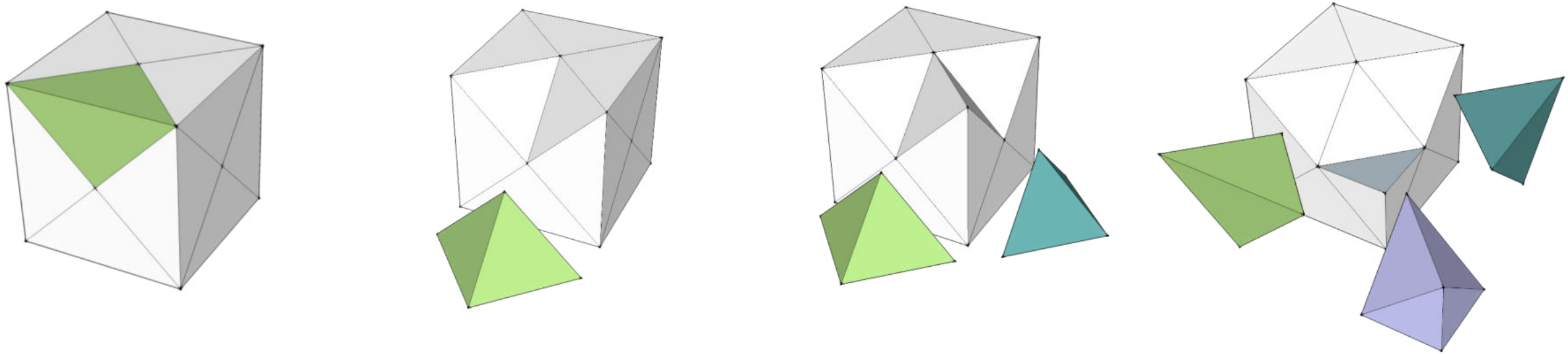
Concept 2

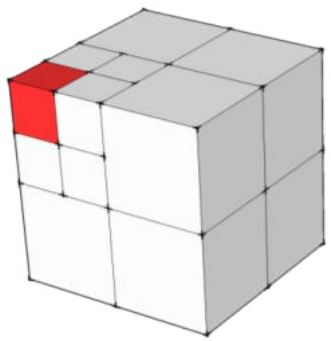
Identification of 3-D shapes: Cubes, Cuboid, cylinder, sphere, cone,
Prism (triangular), pyramid (triangular and square) Identification and locating in the surroundings

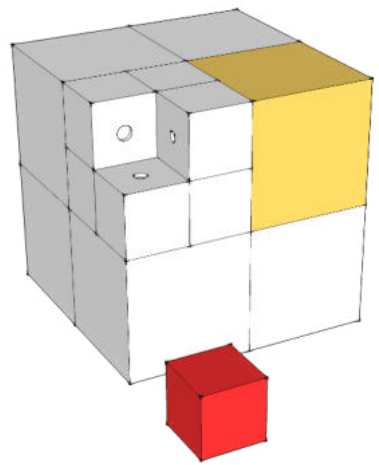
Elements of 3-D figures. (Faces, Edges and vertices)

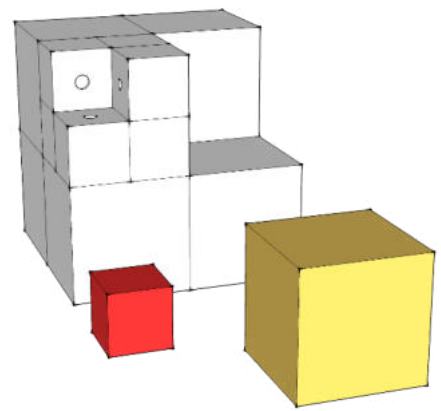
- Nets for cube, cuboid, cylinders, cones and tetrahedrons.

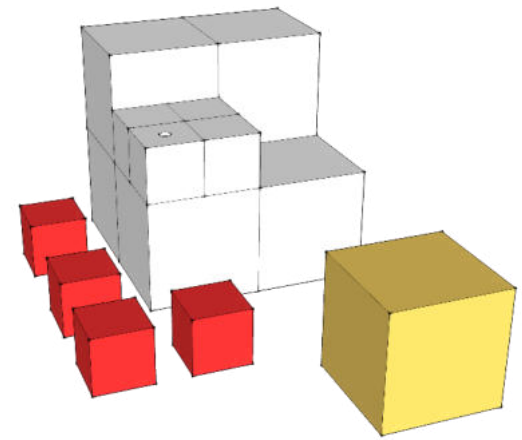





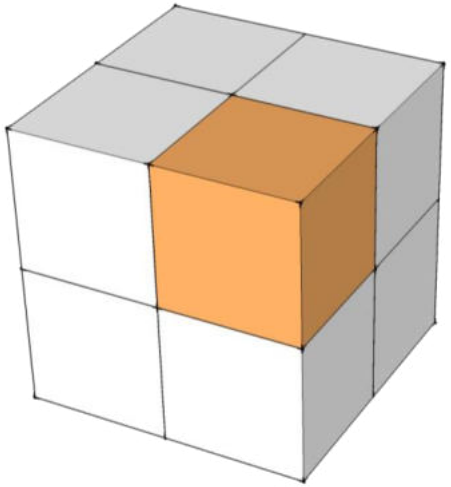


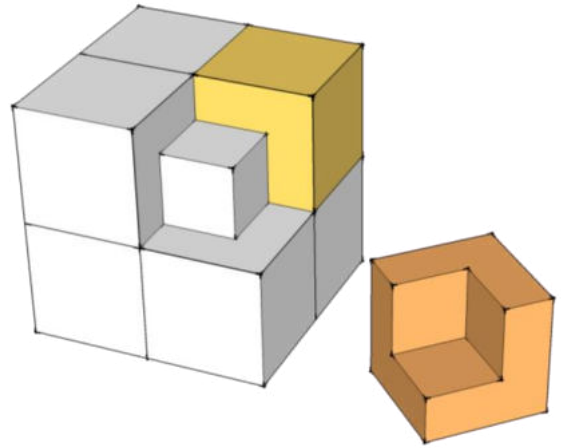


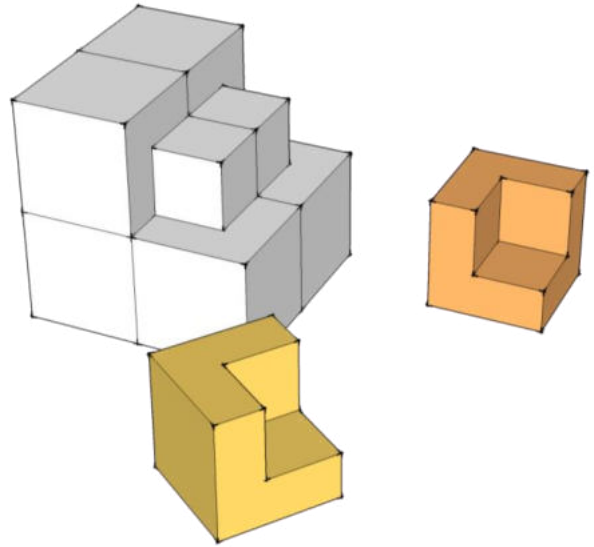


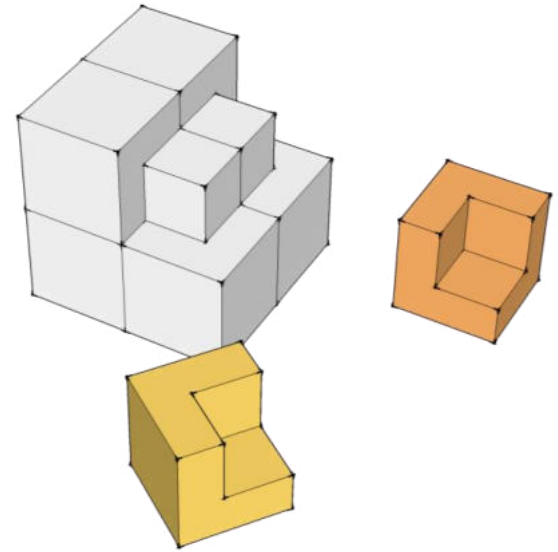






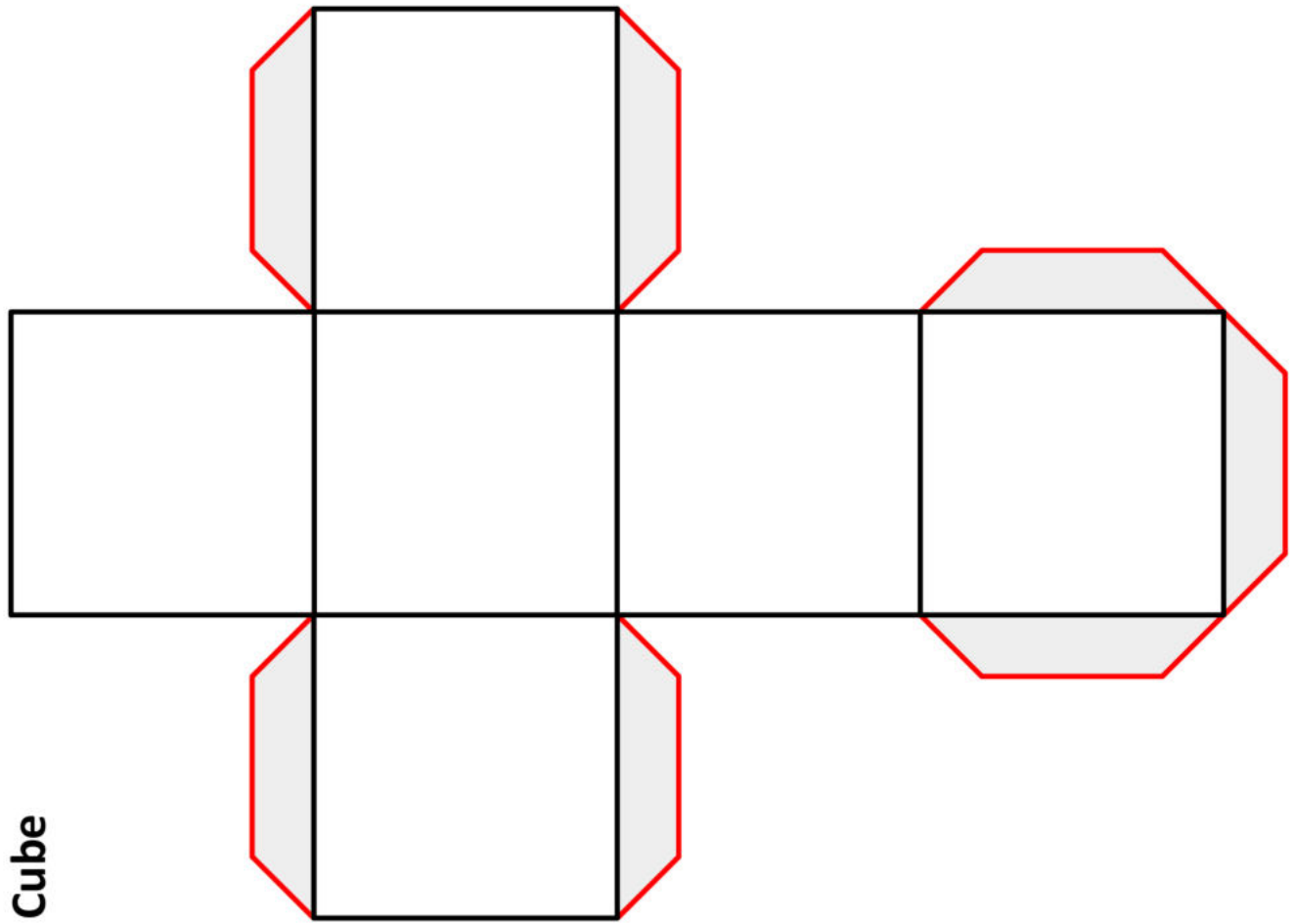




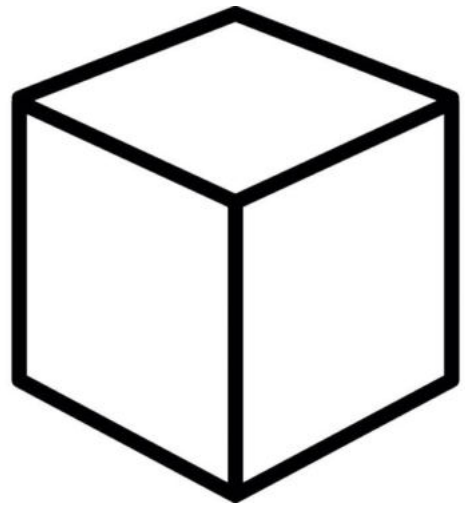


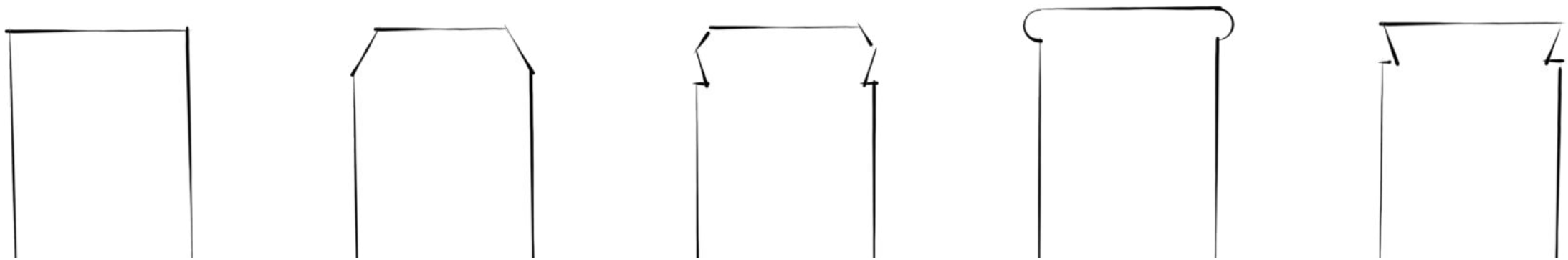
Concept 3

Nets for constructing solids



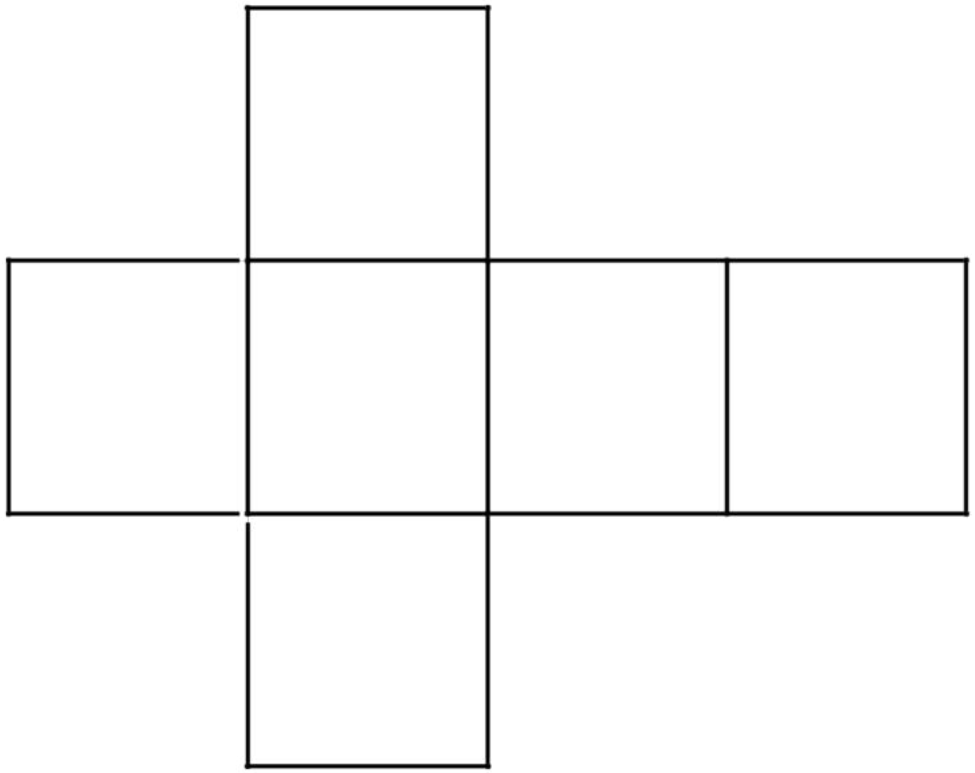
Cube



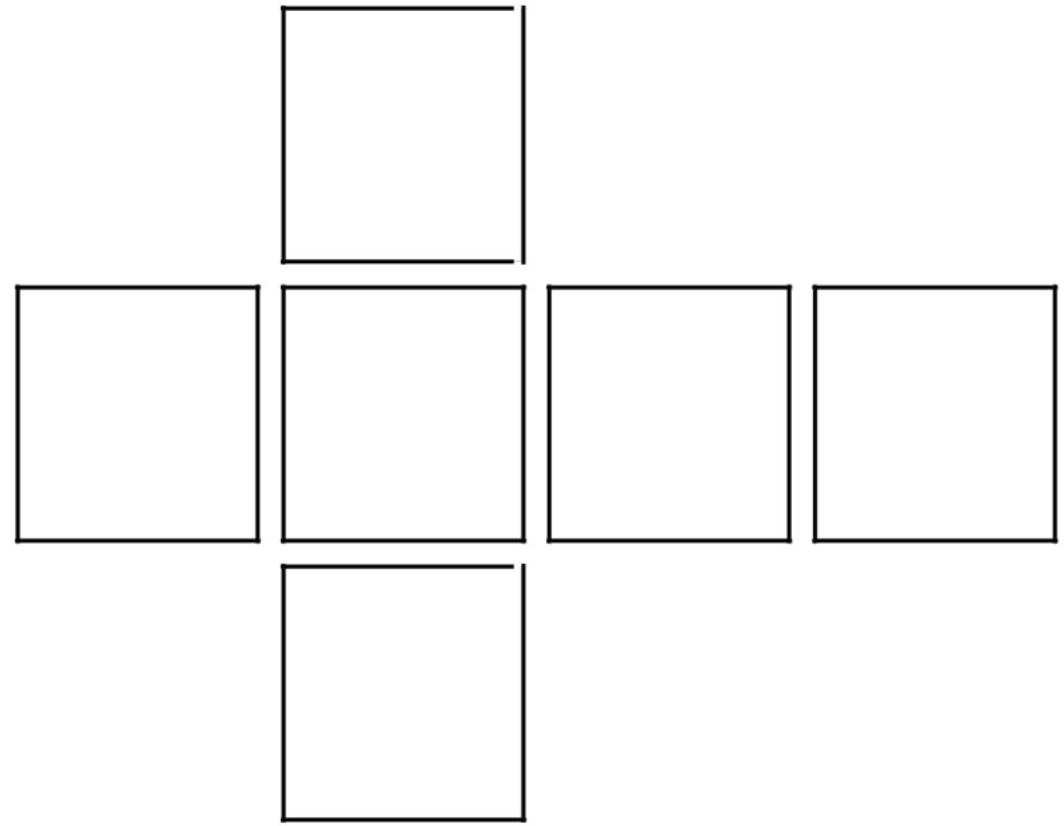


Net – joining detail exploration

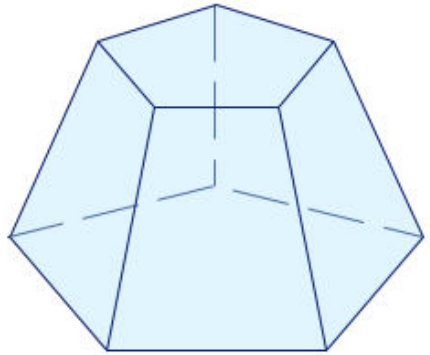
Net – structure- single piece



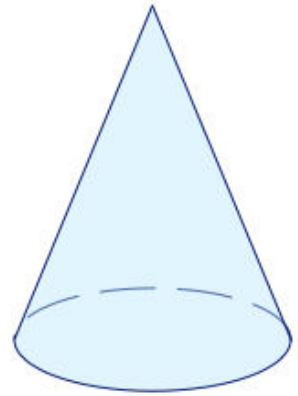
Net – structure- separate pieces



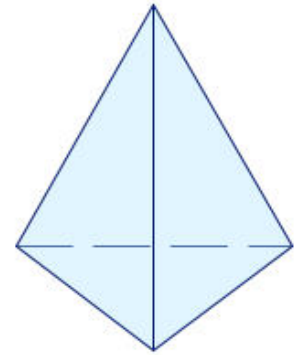
Net – structure



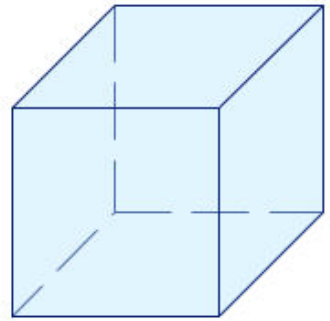
Pentagonal pyramid with flat top



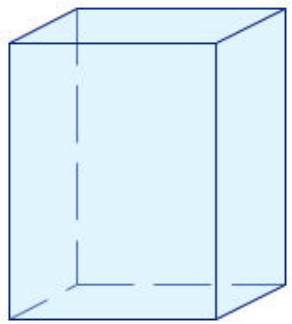
Cone



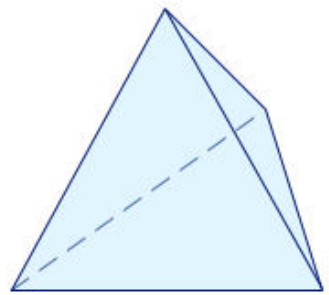
4-sided pyramid



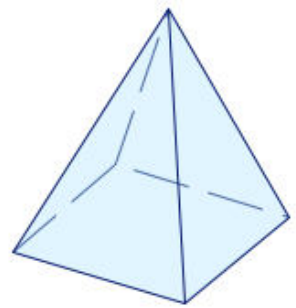
Cube



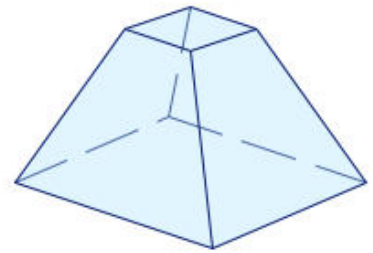
Rectangular box



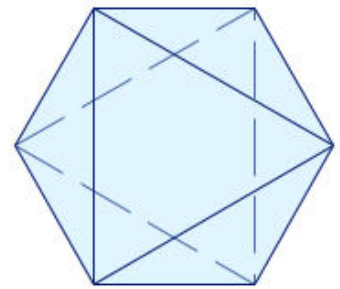
Tetrahedron



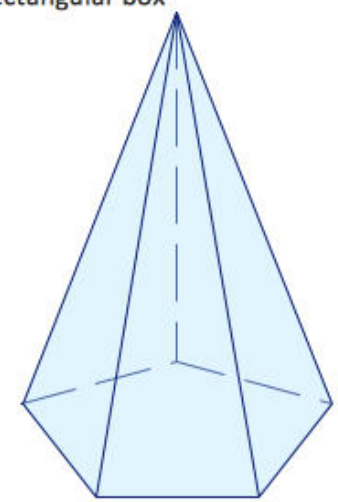
Pyramid



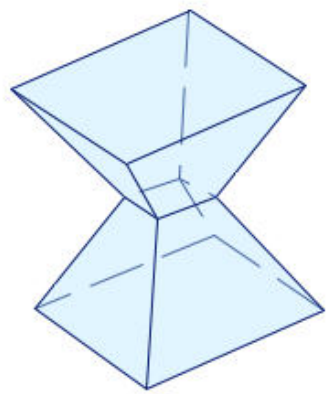
Pyramid with flat top



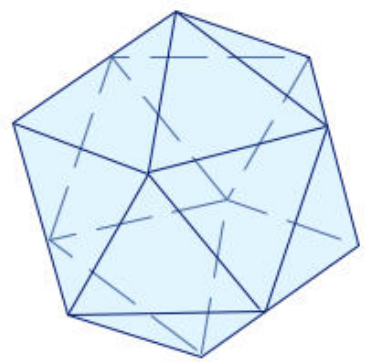
Octahedron



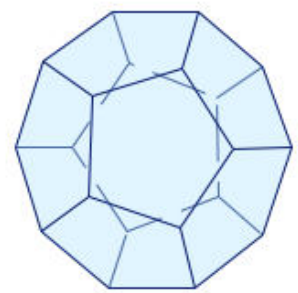
Pentagonal cone



Irregular polyhedron



Icosahedron

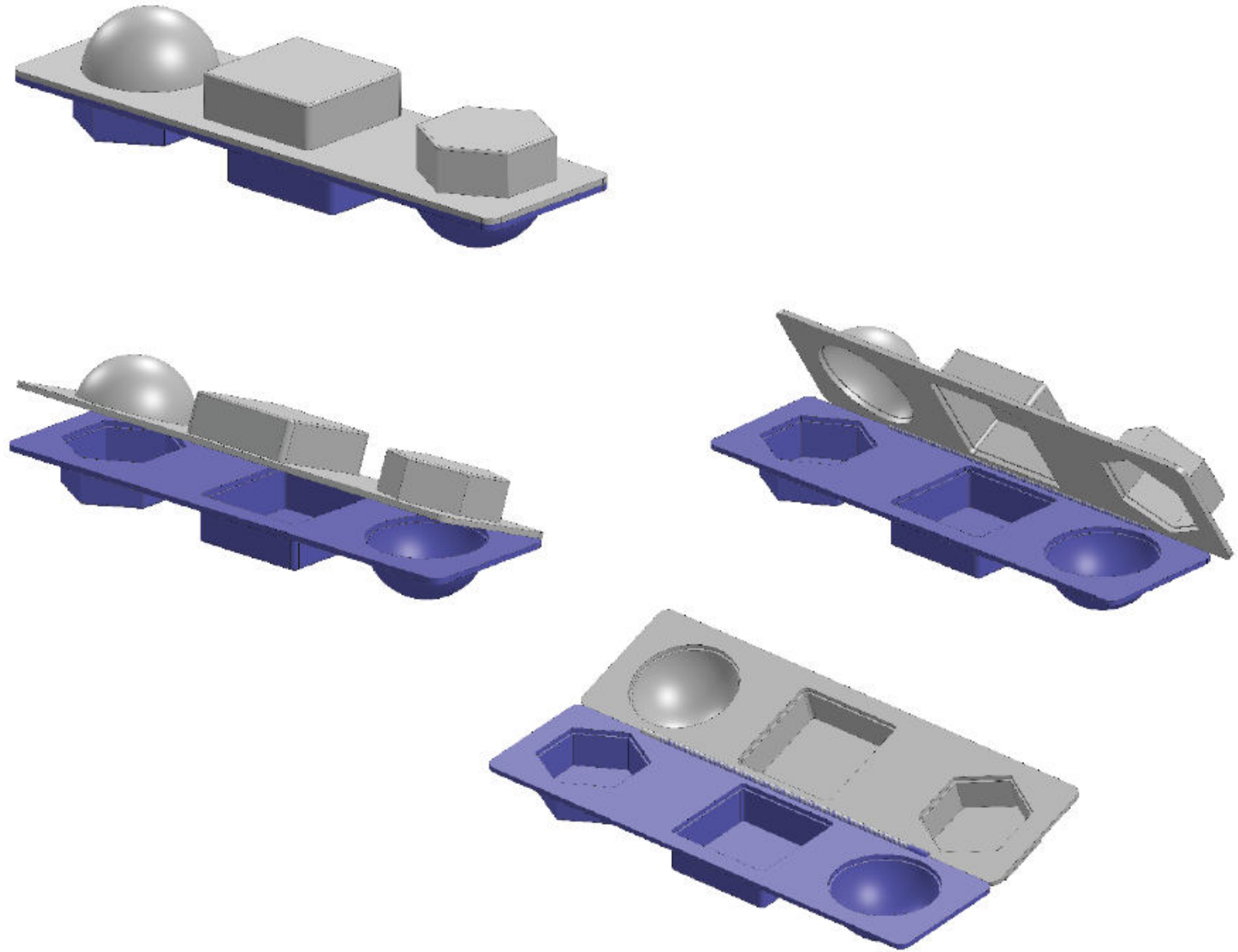


Dodecahedron

+ more

Concept 4

Play dough – mold concept




http://www.fridgecheck.com/images/blogpost/images/3.JPG

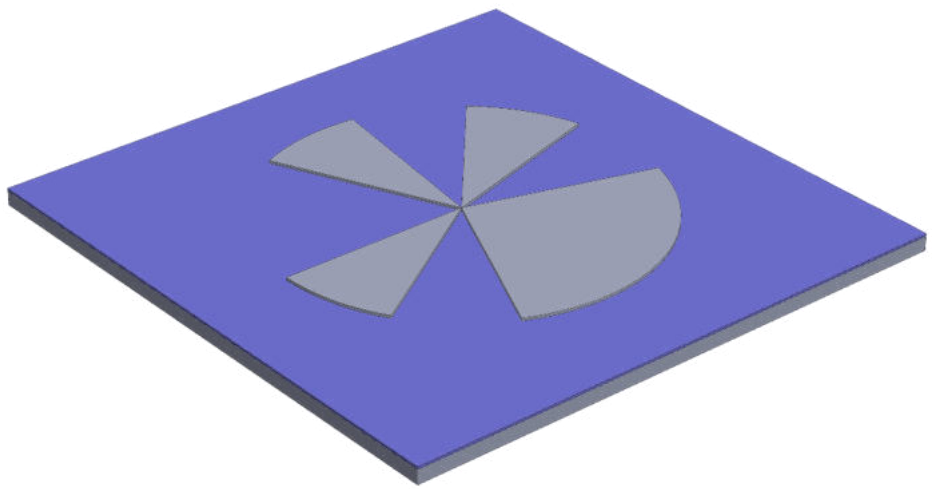
	Concept 1 Geo-base	Concept 2 Modular	Concept 3 NETS	Concept 4 Mold and clay
Most resembles the theoretical Model	9	8	9	8
Easy to use	9	9	9	9
Easy to understand	9	8	9	9
Cost effective (Manufacturability, Easy to make, fast to make, Material and technology)	8	6	9	7
Compact (easy to carry, Easy to store.)	8	7	9	7
Long lasting	8	8	8	8
Other possibilities	playful activities	playful activities	playful activities	playful activities
Syllabus covered	Most 2D shapes	3D solids	Most 3D solids and surfaces	Most 3D solids and surfaces
Appropriateness to the context	9	8	9	8
Total	60	54	62	56

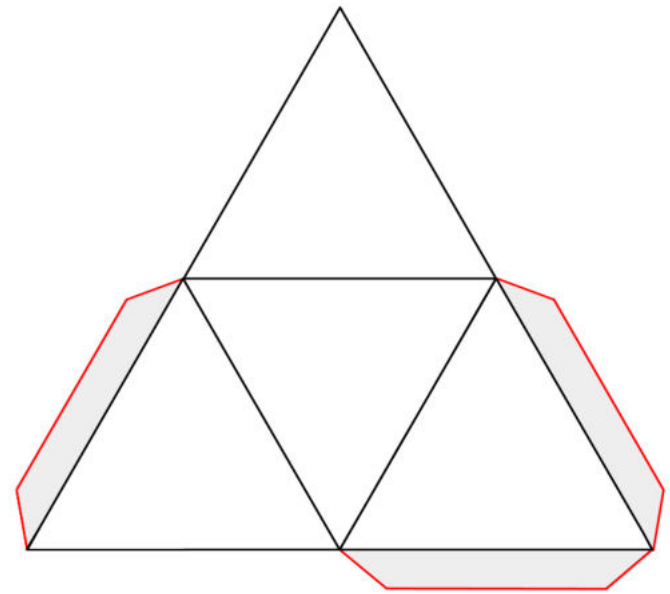
A kit including

Concept 1 + **Concept 3**

Geo-base

Nets for constructing solids





What next?

Prototype Testing
Final concept refinement
Packaging, branding and other works
Delivery

References

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The ways of teaching mathematics to visually impaired students
Iveta Kohanová
Faculty of Mathematics, Physics and Informatics, Comenius University
Bratislava, Slovakia . 2016. . [ONLINE] Available at: http://tsg.icme11.org/document/get/716. [Accessed 04 March 2016].

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Title - “Learning Aid For Visually Impaired Children”,
Name of student - Priyanka Chavan. Guide - Prof : Mandar Rane.

Title - “Playing kit for Visually Impaired children”,
Name of student - Sanjay B Nair. Guide - Prof : R. Sandesh. year -2010

Title - “Vocational/Educational Aids for the visually handicapped”,
Name of student - Sanjay T Koli. Guide - Prof : Mohan Bhandari. year -1991

Title - “2D SPACE UNDERSTANDING FOR BLIND BY APPLYING 3D CONCEPTS”, Name of student - Shweta Kamble.
Guide - Prof : Prof. G G Ray. year -Design Research Seminar 2014

Title - “Computer for blind”, Name of student - Sudhakar S Lahade.
Guide - Prof : Mohan Bhandari , co-guide- N.Sadhu . year -1992

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Name of student - Anirban Ghosh. Guide - Prof : G G Ray & Prof. year -1996

Title - “Product Information Deciphering Device for the blind”,
Name of student - Sachin Patil. Guide - Prof : G G Ray &
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Thank you