

Honors Geometry Polyhedron Project

Due: Tuesday, May 14th, 2019 (At the beginning of class)

For this project you will create a polyhedron, a geometric solid with polygonal faces. The purpose of this project is to give you a hands-on experience with designing, planning and construction of a precise physical model from given criteria.

Criteria: The shortest edge length of your polyhedron should be exactly **7.2 cm**.

Grading: This project is worth 100 Exam points and 20 POW points. It is considered as half of your final exam!

You will be graded on the following:

- **Drawing/print out of net and template piece:** 10 POW points
Due Tuesday April 30th, 2019. Not accepted late.

The drawing of the net does not need to be the finished size, but must show all necessary pieces and you must find each angle measure. You may use printouts from the computer (cite the website).

The **template** is an accurate construction of each polygon that will be required in order to complete your net. It is not the net of the polyhedron. For example, if your polyhedron is made up of triangles, pentagons and squares, **you must create one full size pattern of each shape with accurate edge lengths and angles. Pattern should be made on cardstock or some other stiff material.**

- **Surface Area:** 10 POW points
Due Tuesday May 7th, 2019. Not accepted late.

You should have the total surface area of your polyhedron calculated. Calculations must be shown. They need to be clear and easy to follow. You should have a sketch of each shape in your polyhedron labeled with the correct dimensions and showing all the steps in your calculations.

Keep the following in mind when constructing your polyhedron. The overall quality of your polyhedron will be part of the grade.

- **Completed Polyhedron:** 100 exam points
Due Tuesday May 14th, 2018. Not accepted late. **MUST TURN IN EARLY IF YOU WILL BE ABSENT**

Be sure to think about the following aspects during selection and construction of your polyhedron

Color Scheme:

A possible color scheme could highlight the geometric properties of your shape. For example, all faces of a certain shape would be the same color, or faces that lie in parallel planes would be the same color. Your shape should be pleasing to look at. Simply making your project out of colored cardstock does not count as decorating.

Durability:

Your shape should stay intact during normal handling and should also stay intact over time.

Accuracy:

Your shape should resemble the shape you selected, with all geometric properties identical. Your shape should have consistently accurate edge lengths. Accuracy will be increased when you make very careful calculations and constructions!

DEADLINES:

April 30th (Tuesday)

Drawing and Templates Due

May 7th (Tuesday)

Surface area calculations due

May 14th (Tuesday)

Project due - late projects will NOT be accepted. Please plan to turn it in early if you will not be here on May 14th.

Pre-made models will not be given a grade.

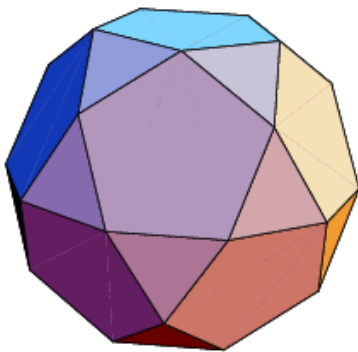
Your Polyhedron choices are:

85 pts max score	100 pts max score	
Icosidodecahedron Truncated Icosahedron Truncated Dodecahedron Great Rhombicuboctahedron Snub Cube	Great Dodecahedron Great Rhombicosidodecahedron Small Rhombicosidodecahedron Snub Dodecahedron Small Stellated Dodecahedron	Great Stellated Dodecahedron Compound of 5 Tetrahedra Small Ditrigonal Icosidodecahedron Dodecadodecahedron Truncated Great Dodecahedron

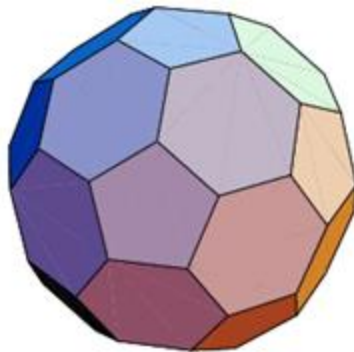
Do some research on the choices - what shapes do you need to be able to accurately construct to make the polyhedra (some are easier than others)? Other polyhedra will be considered if you find one you really want to make.

85 points:

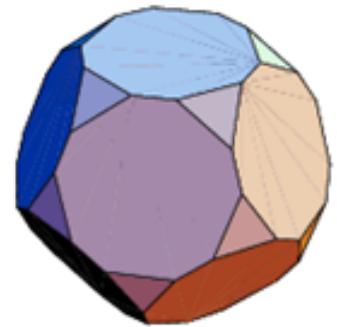
Icosidodecahedron



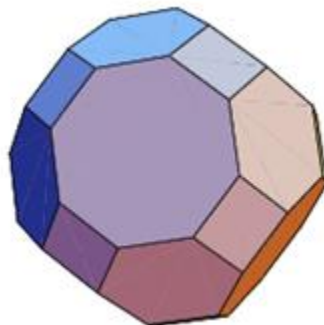
Truncated Icosahedron



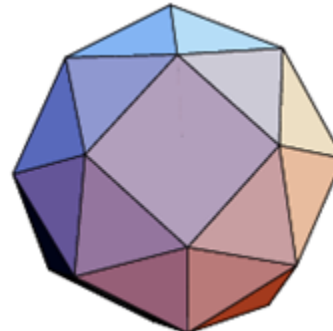
Truncated Dodecahedron



Great Rhombicuboctahedron

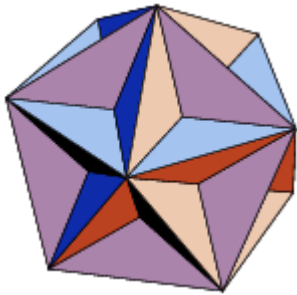


Snub Cube

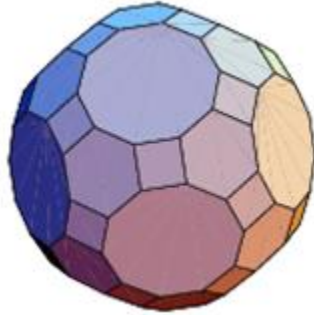


100 points:

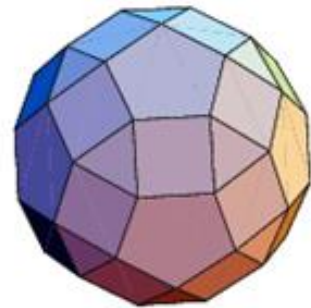
Great Dodecahedron



Great Rhombicosidodecahedron



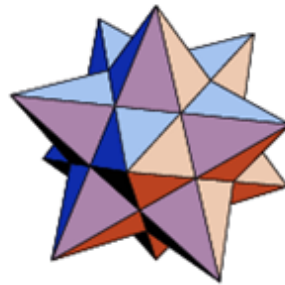
Small Rhombicosidodecahedron



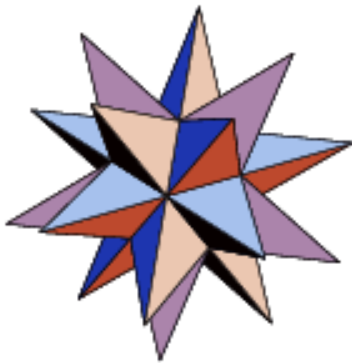
Snub Dodecahedron



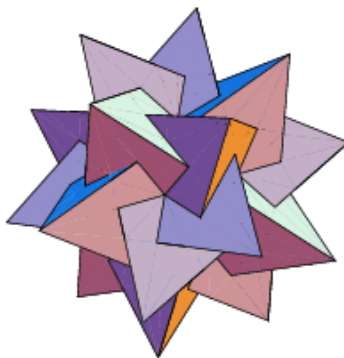
Small Stellated Dodecahedron



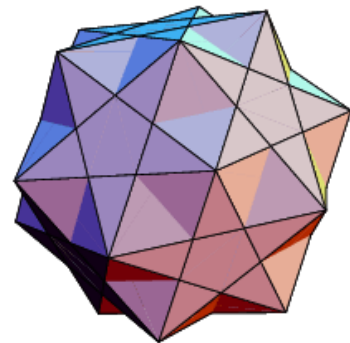
Great Stellated Dodecahedron



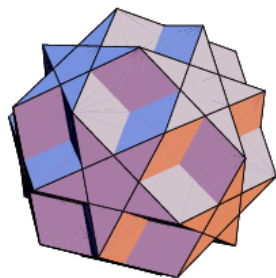
Compound of 5 Tetrahedra



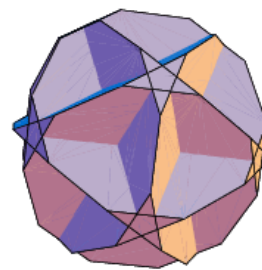
Small Ditrigonal Icosidodecahedron



Dodecadodecahedron



Truncated Great Dodecahedron



Polyhedra Selection (Please turn in this slip with your net and template or sooner)

Name: _____ Period: _____

Shape selection: _____ Max Point Value: _____

Please sign that you have read the requirements for this project and know that it will not be accepted late:
