# Mathematics Lesson Plan

Third form of secondary school

Topic of the lesson: <u>Platonic Solids.</u> (2 lessons - 90 min)

## Aims of the lesson:

## Student:

- is familiar with the concept of polyhedron;
- recognizes prisms and pyramids among polyhedrons;
- distinguishes polygons and knows their properties;
- distinguishes regular polygons;
- is able to define the concept of regular polyhedron, distinguish and name a particular polyhedron;
- is able to describe properties of every platonic solid;

#### Student during the lesson:

- expands mathematical vocabulary;
- develops spatial imagination;
- masters the ability to analyse, generalize and to draw conclusions;
- develops perceptiveness;
- develops manual skills,
- broadens knowledge in the field of history of mathematics and philosophy;
- gets to know the wealth of ",the world of polyhedrons";

### Forms of work:

• pair work;

# Materials:

- models of regular polyhedrons prepared by students;
- presentation "Make yourself a solid"
- sheets with grids of Platonic solids (one per pair);
- sheets with table to fill in during the lesson (one per pair);

### Lesson procedure:

- 1. Presentation of the basic properties of five Platonic solids. Students working in pairs, prepared at home models of the Platonic solids from the grids they had been given. Based on the prepared models and multimedia presentation they describe each of the five Platonic solids, taking into consideration their basic properties.
- 2. Introducing the concept of regular polyhedron. Students guided by the teacher describe the properties distinguishing all the discussed solids and draw a definition of a regular polyhedron.
- 3. The role of regular polyhedrons in the creation of the world according to Plato.
- 4. Euler's theorem showing the relationship between the number of faces, edges and vertices of polyhedron.

Students' task is to determine the number of the faces, edges and vertices of all the Platonic solids, as well as to check whether Euler's identity is true in their cases.

Name	Number of faces [s]	Number of vertices [w]	Number of edges [k]	s + w - k = 2
Regular Tetrahedron				
Hexahedron (cube)				
Regular Octahedron				
Regular Dodecahedron				
Regular Icosahedron				

5. Examples of other polyhedrons (archimedean polyhedrons, *Kepler – Poinsot* polyherdons, truncated pyramids, prisms).

6. Summing up the lesson.