Art 145 Three Dimensional Design
Pilot Assessment
Spring 2023 report

by
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Department of Art and Architecture
Unit-Level Assessment Liaison Report
Spring 2023

Liaison Project Start Date: **January 17, 2023**
Liaison Report prepared by **Paul Wandless**

I. Department Buy-In and Outcome Definition

In 2021, the overall Departmental buy-in was focused around what outcomes were most appropriate to assess a given art course. It was agreed it should be technical (skill based) outcomes because the skills and techniques used can actually be measured with specific degrees of successful completion or execution. The technical-based outcomes are also included at the syllabus level, degree level and program level, so this fulfills the requirement of how a measured outcome is represented at all levels. Currently there is a working set of agreed upon AFA Degree PLOs. The 3D/Sculpture Program has a working set of LOs and all the syllabi have SLOs. Only the syllabi are official and PACC approved. Below is what's being used for this assessment.

Technical AFA Degree Learning Outcome

1. Develop technical competence in a broad range of skills and tools for the manipulation of materials and mediums within the fine arts disciplines.

Technical 3D/Sculpture Program Learning Outcome

1. Demonstrate competence in the application of a broad range of technical skills for the fine arts disciplines with appropriate tools, materials and mediums.

Technical Student Learning Outcomes (Art 145 syllabus)

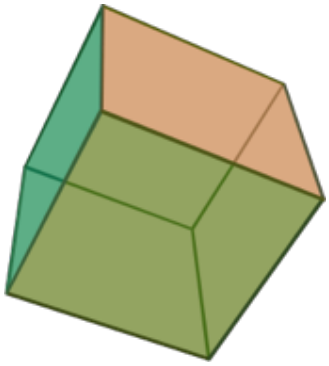
1. Effectively and appropriately use the tools, supplies and materials necessary to create three-dimensional work.
2. Demonstrate an understanding and knowledge of how to appropriately, effectively and safely use tools, adhesives, binders and instruments of three-dimensional design.

II. Assessment Research and Design

This pilot assessment tool focuses on technical skills required to fabricate platonic solids using stiff paper and to prepare students to make volumetric forms to create sculptures. The rubric measures the subset of individual tasks that cumulate into the overall technical skill learned to fabricate platonic solids. In this case the platonic solids are a cube and a tetrahedron. The rubric scores each individual task/skill used to fabricate the platonic solid and ascertains the student's level of command with the tasks/skills. This allows for measurement of the overall skill of constructing a platonic solid and the individual tasks required for its successful completion. The rubric also measures the level of craftsmanship with the manipulation of materials.

Students are introduced to the skills for making platonic solids during week 1 and 2 of the semester. These skills are then used in Project 1, which is to fabricate a volumetric sculpture made of multiple volumetric forms. This project applies the skills used to make the platonic solids and reinforces them as they make forms to complete the volumetric sculpture. This project is normally completed in week 4. Some forms incorporated in the project are platonic, but students can also apply the subset of fabrication skills to making any volumetric form that needs to be drawn, cut and folded.

The platonic solid assignment given at the start of the semester and the assessment run at the end of the semester use the same two platonic solids. The difference being, the assignment in week 1 has two classes to be completed, while the assessment in week 15 has just one. The cube is low difficulty, the tetrahedron is medium difficulty. The symmetrical polygon used, the number of individual measurements needed, and the complexity of folding required, determines the overall degree of difficulty for the solids.



Cube, 6 square faces

Tetrahedron, 4 triangular faces

III. Pilot Assessment Tools and Processes

The assessment tool measures the technical skills of measuring accurately, cleanly and accurately cutting with an Exacto knife and folding properly along pre-drawn lines to create a perfectly symmetrical platonic solid. There are specific instructions indicating the parameters for measuring, cutting and folding. All students are supplied bristol board (stiff paper) as the material to fabricate the platonic solid to keep the material variable the same for all.

Making a platonic solids is an assignment during the first two weeks of the semester. This is where the skills are introduced and they're reinforced with a project requiring them to make a wide variety of volumetric forms with stiff paper boards demonstrating these skills. So assessing these skills at the end of the semester, discovers how well the students retained command of the skills and their ability to apply them when making volumetric forms.

** Assessment tool, descriptive rubric and scoring rubric are included in appendix.*

IV. Administration of Pilot Assessment

The assessment ran week 15, so the tools, fabrication processes and core concepts have been reinforced the whole semester. One class period (2hr, 50min) was used to complete the assessment. Bristol board was provided to all students for consistency of this variable. Rulers, pencils and Exacto knives were made available in case a student did not have one of these items.

The assessment was run in two sections of Art 145. One section was a regular Harold Washington College students and one section was a CPS High School Dual Enrollment class consisting of 11th grade students.

At the end of the class, all platonic solids are collected. Scoring happens during week 16 and the descriptive rubric is utilized for this process.

Students are instructed to not put their names on the platonic solids so the process is anonymous for them. This element also helps remove any anxiety a student may feel when performing the assessment. Since there is no reliable way to track students through future art courses, this data point isn't needed. If in the future a reliable process is developed that would provide usable and relevant data, this can be revisited.

V. Data Analysis

Since the two sections were populated by two different student classifications (college and high school) the data will be separated by section, rather than combining all the data. Due to the inherent advantage of experience that college students have over high school students, the data would be skewed if combined.

While the ability to properly measure, cut and fold may seem to be basic tasks, the ability to apply all these skills with the precision to fabricate a symmetrical platonic solid by hand is not a basic task. If any one of the variables are done even slightly incorrectly, the edges will not align symmetrically and the platonic solid will not have been fabricated successfully.

Specific numbers will not be used as part of the data analysis since the sample sizes were small. The separation of the two sections make the data analysis only applicable to the individual sections themselves. The observations from the data are still a valid representation of how the skills were performed, but the analysis is filtered through the context of the section it happened. I taught both Art 145 sections, so my anticipated scoring comments come from observing all the students throughout the semester.

College section data analysis & observations

The skills of measuring, cutting, folding and taping were *met* by all participants for both platonic solids. This was anticipated based on the amount of time these skills were used during the semester and the success they demonstrated applying the skills in the volumetric projects.

- The platonic solids created for the assessment were all successfully completed in the given time-frame, which demonstrates the skills learned have been mastered for this task.

- There was approximately 30 minutes remaining in class, which demonstrates how well the skills of making a cube and tetrahedron were mastered. During week 1, two class periods were given to accomplish this task, but most students only needed the hour of the second class to complete the forms.

- The level of craft was *met* for all the students. This score follows suit with all scores being *met* for learning and applying the skills to fabricate platonic solids. Quality of craftsmanship typically follows form with technical execution. So with all the tasks being successfully performed, the level of craft while doing so was also met as part of the overall process.

CPS High School section data analysis & observations

The skills of measuring, cutting and folding were divided between *proficient* and *room for growth* by all participants for both of the platonic solids. This was anticipated based on how these skills continued to be a challenge for the students throughout the semester when trying to use them to create the volumetric sculpture project.

- All but 2 students worked right to the very end of the class to finish the platonic solids. This demonstrates the skills of making a cube and tetrahedron were not mastered. During week 1, two class periods were given to accomplish this task and the entirely of both classes were needed. So completing the task in one class is an overall achievement for this section.

- The 11th graders had no relevant prior experiences with the materials and processes to make platonic solids. Because of this, it took longer for them to get started on the week 1 assignment because additional instruction was needed to close this experience gap. The assessment revealed that more time and experience is still needed to master the skills. Based on where their skills sets began, this was an expected conclusion. This course was their very first three- dimensional design academic experience, which in-and-of-itself made this a challenge to accomplish.

- The level of craft was *room for growth* for all the students. This follows suit with *proficient* and *room for growth* being the range of scores for learning and applying the skills to fabricate platonic solids. Some students started to rush the process towards the end of class as time was getting short. This led to the cutting and folding being rushed, which impacted properly accomplishing those skills. While a few platonic solids did meet all expectations, the majority of solids had some cutting or folding issues. A couple forms had issues with all three skills.

- In general, the skills were executed better in the week 15 assessment than they were during the week 1 introduction of these skills. As 11th graders from schools with no or few art classes, they were all at a technical and experiential disadvantage when presented with the platonic solid assignment. All worked hard and applied what was learned, just the speed of properly applying the skills is what was lacking. That simply comes with more time and experience using the skills to fabricate volumetric forms. I'm confident those who continue with art courses will and can master these skills and perform them properly at a quicker tempo.

VI. Supporting Evidence-Based Change (Use of Findings)

Success Factors

The main factors that contribute to putting students in the position to be successful is information and practice.

1. Introducing terminology with shared vocabulary made understanding of the concepts of Platonic Solids and how to successfully complete them more effective.
   * *Platonic solid Resource is included in appendix.*

2. Applying the skills of creating Platonic Solids to creating volumetric forms in a project successfully reinforced the introduced skills.

Recommendations to apply to Fall 2023 assessment.

The pilot assessment revealed a few areas to modify the assessment. This was the first time running this particular tool. A prior version included an additional section that had students answer multiple choice questions for projected sculptural images.

1. Use the week 1 platonic solid assignment as a pre-assessment. This will allow to see the actual retention of skill performance from week 1 to week 15.

2. Based on all the skills being met (HW College students), a third more platonic solid will be added to the assignment and assessment. This will add more rigor to the application of the learned skills.

3. The prior two-part assessment was difficult to complete in one setting. Creating platonic solids and giving answers to projected images is still a good idea though to have hands-on and cognitive assessments in one course. The Fall 2023 will include the cognitive section again, but in a different format. The images will be in the handout with the questions. This will allow for students to work at their own pace, versus the pace of the instructor projecting the images.

4. Administration of the Fall 2023 assessment will change to reflect having an additional part. Making the platonic solids will happen first. As soon as they are completed, the student can then answer the questions in the hand out. The instructions will be to answer as many as questions as possible. Some may answer all of them, but some may not if they find there isn't much time left after completing their platonic solids. The results of how many questions are answered will determine if its an appropriate amount to use again Spring 2024.

Appendix

I Assessment Tool

II Descriptive Rubric

III Scoring Rubric

IV Platonic Solid Resource

Appendix I. Assessment Tool

Fabricating Platonic solids (measure, cut, fold, tape)

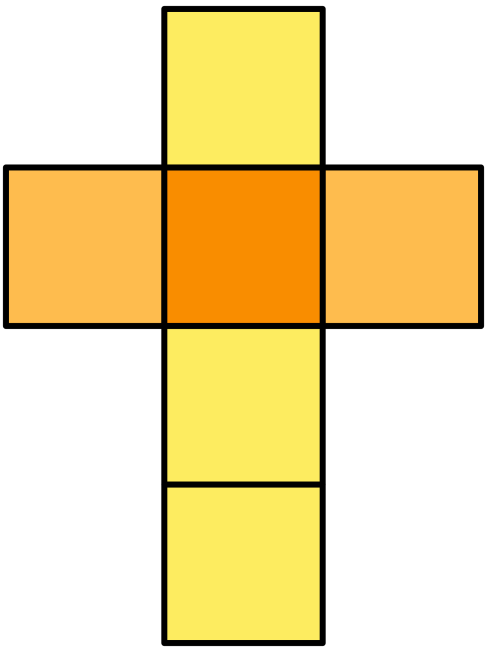
Fabricate the cube and tetrahedron Platonic solids using the templates provided below. Supplies needed are ruler, pencil, Exacto knife and 1 sheet of supplied bristol board.

Steps and Suggested Supplies

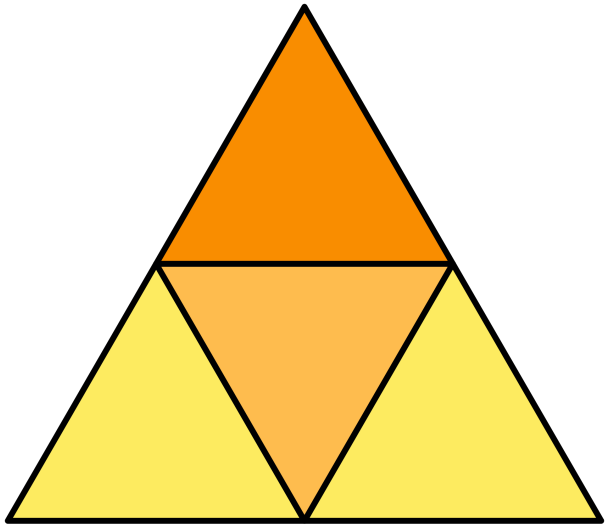
Measuring - Length of side is indicated beneath each template.
use ruler, pencil and sheet of bristol board

Cutting - Cut out the drawn template.
use Exacto knife and ruler

Folding - Fold template along the proper lines to form the platonic solid.
use ruler



cube (2” side)



tetrahedron (3” side)

Appendix II. Descriptive Rubric

Rubric	4 Met	3 Proficient	2 Room For Growth	1 Not Met
Skill				
Measuring	100% (All) faces are correct	99%- 75% (majority) of faces are correct	75% - 50% (most) of faces are correct	Less than 50% of faces are correct
Cutting	100% (All) cuts are correct	99%- 75% (majority) of cuts are correct	75% - 50% (most) of cuts are correct	Less than 50% of cuts are correct
Folding	100% (All) folds are correct. No gaps on edges.	99%- 75% (majority) of folds are correct. One gap or 1 - 2 partial gaps.	75% - 50% (most) of folds are correct. Two gaps 3+ partial gaps.	Less than 50% of cuts are correct. Gaps or partial gaps on all edges.
Level of Craft	All edges meet neatly and edges cleanly cut to fit.	All edges meet neatly, but not cut to fit.	Edges meet, but not neatly and cutting irregular.	Edges don't meet with poor cutting.

Appendix III. Scoring Rubric

Rubric	4 Met	3 Proficient	2 Room For Growth	1 Not Met
Skills				
Measuring				
Cutting				
Folding				
Level of Craft				

Appendix IV. Platonic Solid Resource

Harold Washington College **Spring 2023**
Art 145 - 3D Design **Prof. Paul Wandless**

Platonic Solids

Discussion: Polygons (planes) to Polyhedron (solid forms)

In 3D Design...Planes to Forms

One approach to 3D design is taking polygons *(planes)* and connecting them at their edges to create polyhedrons *(forms)*, then connecting the forms together to create volumetric sculpture. The choice of size, shape, color and surface of these forms will then determine the aesthetic of the finished work. This strategy of constructing forms to build sculptures or structures is an ancient way of working for both artists and architects dating back before the Babylonians.

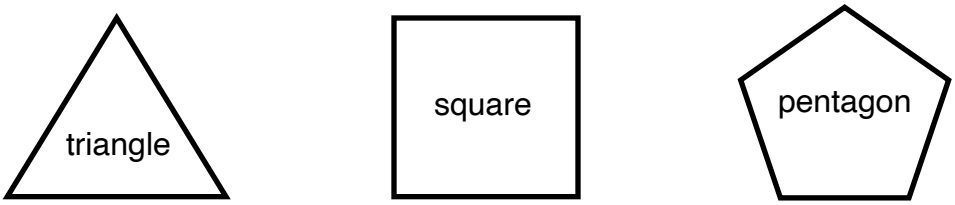
In Geometry...Planes to Solids

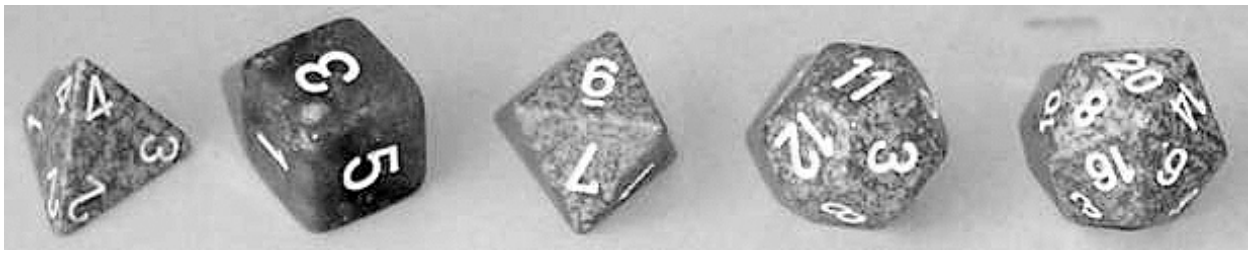
A flat plane (closed 2-dimensional shape) made up of straight lines and angled corners is called a **Polygon**. Connecting multiple flat planes (polygons) by their straight edges create geometric solids (forms) called **Polyhedron**. These geometric forms range from single solids to complex stellated solids. There are several different classes with the *Platonic* (5 symmetrical polyhedra), *Kepler-Poinsot* (4 regular star polyhedra) and *Archimedean* (13 semi-regular polyhedra) being the most recognized solids.

A **regular polyhedron** (there are 9) is a geometric solid with flat faces and straight edges. The 5 symmetrical **polyhedron** are known as '**Platonic solids**'. All the faces of a Platonic solid are regular polygons of the same size, and all the vertices look identical. The Kepler-Poinsot stars are the other 4 regular polyhedron.

The 5 Platonic solids:

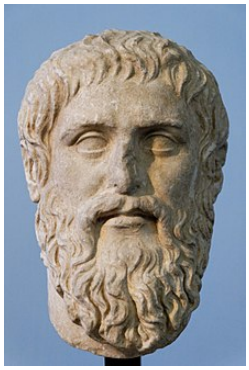
Tetrahedron with 4 triangular faces.
Cube with 6 square faces.
Octahedron with 8 triangular faces.
Dodecahedron with 12 pentagonal faces.
Icosahedron with 20 triangular faces.





Brief History of Platonic Solids

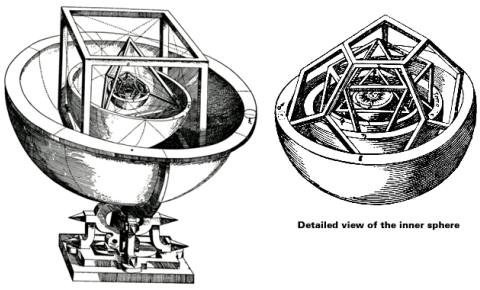
Platonic solids have been identified and known since antiquity. Ornamented models of them can be found among the carved stone balls created by the late neolithic people of Scotland at least 1000 years before Plato. Dice go back to the dawn of civilization with shapes that foreshadowed formal charting of the Platonic solids and modern games the playing dice still utilize all five regular solids.



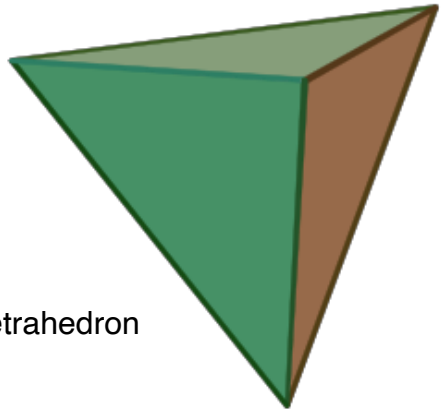
Platonic solids are featured prominently in the philosophy of Plato for whom they are named. Plato wrote about them in the dialogue *Timaeus c.*360 B.C. where he associated each of the four classical elements (earth, air, water, and fire) with a regular solid. Earth was associated with the cube, air with the octahedron, water with the icosahedron, and fire with the tetrahedron.

There were also intuitive (metaphorical) justifications for these associations: the heat of fire feels sharp and stabbing (tetrahedra). Air is made of the octahedron; its minuscule components are so smooth that one can barely feel it. Water, the icosahedron, flows out of one's hand when picked up, as if it is made of tiny little balls. By contrast, a highly un-spherical solid, the hexahedron (cube) represents earth. These clumsy little solids cause dirt to crumble and break when picked up, in stark difference to the smooth flow of water. The fifth Platonic solid, the dodecahedron, Plato obscurely remarks, "...the gods used for arranging the constellations on the whole heaven". Aristotle added a fifth element, aether and proposed that the heavens were made of this element, but he had no interest in matching it with Plato's fifth solid. Mathematician, Johannes Kepler (1571-1630) proposed that the distance relationships between the six planets known at that time (Saturn, Jupiter, Mercury, Venus, Earth, Mars) could be understood in terms of the five Platonic solids.

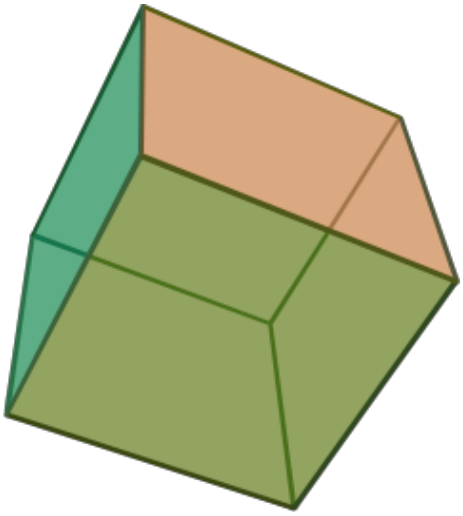
Kepler's Platonic solid model of the solar system from Mysterium Cosmographicum (1596)



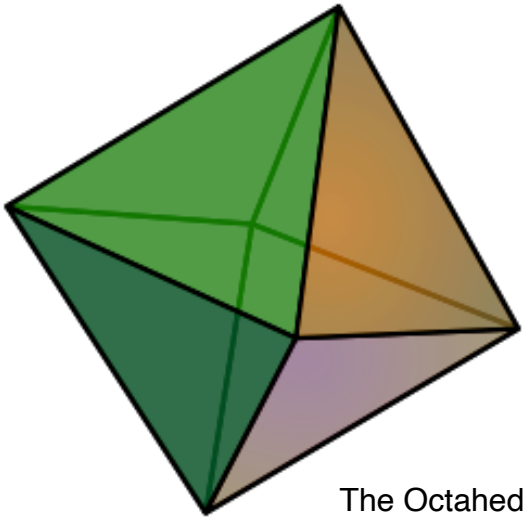
Platonic Solids



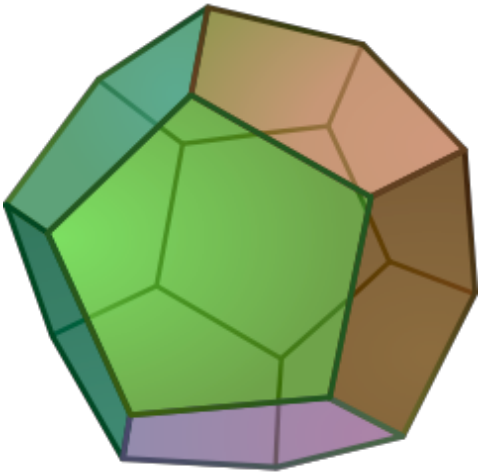
The Tetrahedron



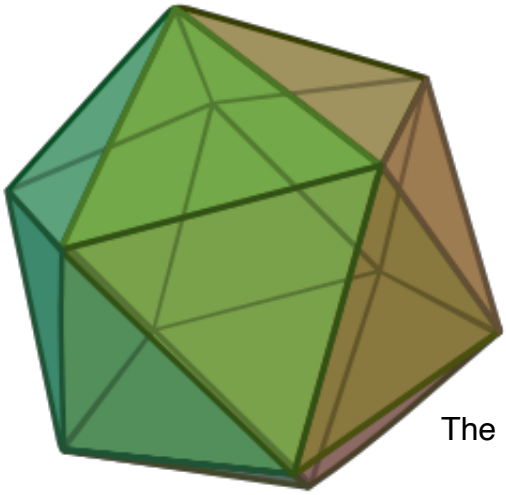
The Cube



The Octahedron



The Dodecahedron



The Icosahedron