



**Description**

- Review understanding of polyhedrons and their nets.
- Construct Platonic solids.

**Materials**

- BLM 17.1, 17.2
- plain, isometric, or orthographic paper
- polyhedron manipulatives

**Assessment Opportunities**

**Minds On ...**

**Whole Class → Discussion**

**Curriculum Expectations/Question & Answer/Mental Note:** Students identify which one of two model-making activities is most appropriate for them based on their prior knowledge of nets.

Using a collection of polyhedrons and nets, show students a net and ask what the corresponding 3-D figure would be. Show a polyhedron and ask what shapes would make up its net. Students describe the faces of a rectangular prism.

Explain that some students will review and revisit construction of polyhedra and nets. Other students will extend prior knowledge through an investigation of the traits of Platonic solids (BLM 17.2).

**Action!**

**Small Groups → Differentiated Instruction**

**Students needing review:** Using the shapes on BLM 17.1 and 17.2 as patterns, make available multiple copies of each shape or reproduce the shapes on tagboard for students to use as patterns to cut out the required number of shapes for constructing the polyhedron. Depending on the manual dexterity of students, tabs on the sides of the shapes may make construction easier. Students tape the edges of the shapes together to construct as many different polyhedrons as possible (concave as well as convex). They can combine different polyhedrons to make irregular and unusual polyhedrons and name and describe the solid they constructed.

Circulate among the groups, discussing the process with them, listening for proper terminology and evidence of understanding. Ask higher-order questions such as: Which polyhedron has the smallest surface area? the greatest? How could your collection of polyhedrons be grouped or ordered? Is it possible to build polyhedrons with 4, 5, 6...12 faces? Name the solids you are able to construct.

**Students ready to extend their prior knowledge:** Students build the Platonic solids and investigate why there are only five possible solids that satisfy the definition of a Platonic solid. (BLM 17.2)

**Consolidate Debrief**

**Whole Class → Group Presentations**

Students display and describe orally their polyhedron constructions or the results of their investigation of Platonic solids.

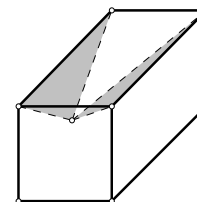
**Home Activity or Further Classroom Consolidation**

- Decorate at least one polyhedron as a possible ‘package’ for a product, e.g., a fancy box for a perfume bottle or chocolate, a holiday ornament, etc. Write a detailed description of how to construct it, and an advertisement for the product.
- Look for an ‘unusual’ polyhedron at home. Write a poem, song, or rap about its structure.
- Collect pictures of various polyhedrons to put into a collage. Write a brief explanation of the characteristics of several of the polyhedrons you selected.

*Differentiated Application  
Concept Practice*



An example of a convex polyhedron



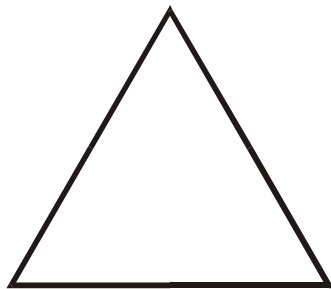
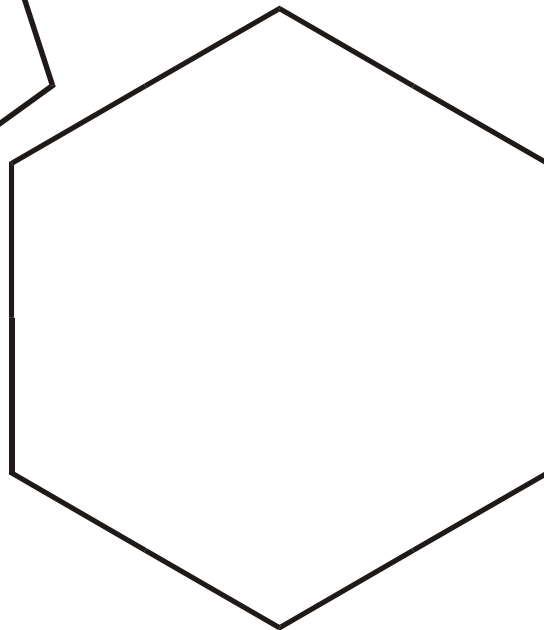
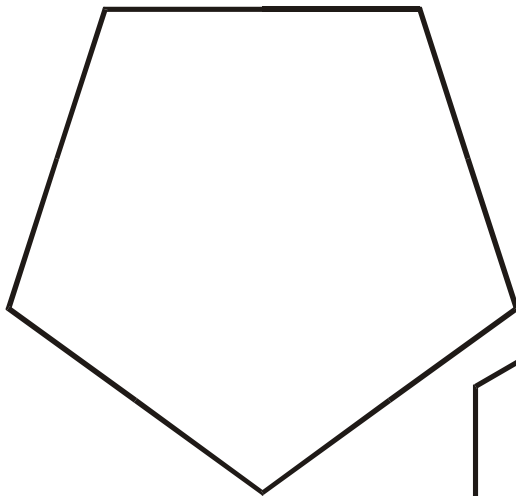
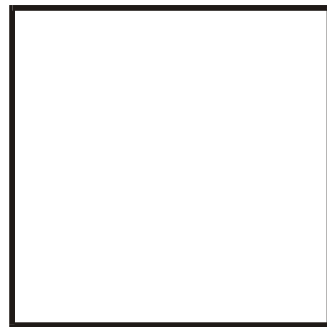
If polyhedron manipulatives are available, they could be used instead (BLM 17.2), especially for students who lack manual dexterity.

Select a student to add vocabulary to the Word Wall.

The tasks provide cross-curricular linkages. It may be appropriate to offer students a choice as to which task they do.

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## 17.1: Building Solids – Teacher



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## 17.2: Building the Platonic Solids – Teacher

