

**Teacher: Katia Hagen and Mentor: Carrol Ordner**

## Second Year Mentor Project

Austin School District, Cook Elementary campus

4th grade, Math



Department of Education Transition to Teaching Grant, 2004

## Plan

This project will entail teaching solids and angles. Students will understand the concept of solids, edges, faces, and vertices. Students will recognize and differentiate right, acute, and obtuse angles.

These lessons will provide the necessary elements for students to distinguish different solids such as cubes, spheres, cones, prisms, and pyramids; as well as an understanding of angles.

## Objectives

To explore, recognize, and differentiate solids and angles (Week 7, 3rd 9 weeks, IPGs: Solids and Silhouettes):

Math TEKS

- 4.8 Geometry and spatial reasoning: the student describes lines, shapes, and solids using formal geometric language
- 4.14 Underlying processes and mathematical tools: the student applies Grade 4 mathematics to solve problems connected to everyday experiences and activities in and outside of school. (D) Use tools such as real objects, manipulatives, and technology to solve problems
- 4.15 The student communicates about Grade 4 mathematics using informal language. (A) Explain and record observations using objects, words, pictures, numbers and technology

## Materials

- Wood solids (cube, cone, sphere, rectangular prism, triangular prism, triangular pyramid, and square pyramid) for each table
- Plastic solids for teacher
- Paper models for students to build their own solids
- Chart paper
- Student worksheet "Math In My World"
- Angle model for each student

## Steps to be Taken

1. Teach lesson "Solids" and "Angles"
2. Students build their own solid models and glue them to chart paper. Students count edges, faces, and vertices for each solid and record on chart
3. Students visualize angles with model and then build their own models with yarn
4. Complete worksheet as an assessment

## Process

- Teacher introduces the lesson on solids and angles
- Students will build their own models for both solids and angles and will use proper math vocabulary to name each element.
- Teacher will scaffold as necessary and work with small groups

### Assessment

- Informal Assessment
  - Observation
  - Degree of completion of Solid Chart and use of math vocabulary
  - Degree of completion of angles
- Formal Assessment
  - Student Worksheet
  - TAKS booklet (Math In My World)

### Data Collected

95% of the students understood the concept of solids and angles. Therefore, there is no need to re-teach to the entire class.

However, 5% of students need further support in the form of small groups/guided math. Peer or buddy support is another way of re-teaching the concept.

### Expected Results

- 100% grasp of the solid and angle concept by the entire class.
- Ability to identify and name the different characteristics of solids without teacher or peer support
- Ability to recognize different angles
- Use and expansion of math vocabulary.

### Conclusion

- The use of different manipulatives (wood solids, solids built with paper models by students, angles, and yarn) facilitated the understanding of the geometry concepts.
- The connection of solids and angles to real life situations enhanced student's ability to define and recognize solids and angles.

### Teacher Reflection

This lesson facilitated the use of numerous and different manipulatives. Even though students had access to different forms of the new concepts introduced, they required a medium-to-high degree of scaffolding. Repetition and visualization were an important factor in the success of this lesson and a requirement for students' grasp of the concept.