

MAISA and the REMC Association of Michigan Best Practices in Technology Integration Plan

Title: Geometry Technical Manual

Subject(s): Mathematics

Intended Grade Level(s): 3

Description:

The purpose of this lesson is to have students identify and describe the properties of plane and solid figures. Students will design a geometry technical manual using word processing and computer graphics. The students will draw and label a number of plane and solid geometric shapes using the computer. Depending on the students' skill in drawing with a mouse, some students may wish to use the computer to type the properties of the shape, and then draw the shape free-hand or use a stencil. Students will draw lines of symmetry and show congruent shapes when possible. All students will be encouraged to use the computer as much as possible for this assignment..

Curriculum Benchmarks:

[MI.MAT.II.1.E.1](#). Recognize and name familiar shapes in one, two, and three, dimensions, such as lines, rectangles and spheres, and discuss the shape of a graph.

[MI.MAT.II.1.E.2](#). Describe the attributes of familiar shapes.

[MI.MAT.II.1.E.3](#). Compare, sort and classify familiar shapes.

[MI.MAT.II.1.E.4](#). Draw and build familiar shapes.

[MI.MAT.II.1.E.6](#). ...(indicate) figures that have similarity and/or congruence.

Materials/Hardware/Software:

Students will need access to a computer, printer and mouse for the duration of this project and *one* of the following software programs:

KIDPIX by Broderbund

The following software programs are very similar to KIDPIX
KidWorks Deluxe by Davidson
Microsoft Paint by Microsoft

Activities/Procedures:

Teacher pre-activities:

1. Instruct students in the attributes of 2 dimensional plane figures: circles, squares, triangles, rectangles, pentagons, hexagons, octagons.
2. Instruct students in the attributes of 3 dimensional solid figures: cubes, spheres, cylinders, cones, pyramids, rectangular prisms.
3. Give examples and explanations of congruent figures and lines of symmetry for the figures and shapes.
4. Allow students to manipulate models of 2D and 3D shapes, sorting them according to attributes.
5. It is helpful for students to compile a notebook containing the above information to refer to in the computer lab.
6. Students may need to be instructed in the use of the computer, mouse, and software. Students will need to know how to save information and how to print. Depending on the students' skill in using a mouse to draw shapes, the students' may wish to types the text on the computer and draw the shapes free hand or with a templates.
7. Decide how many and/or which figures students will illustrate and label in order to demonstrate knowledge of content material.

Activities:

1. Introduce the activity to the students explaining why they are doing it and what they should expect to do and learn.
2. Demonstrate on overhead computer screen how the KidPix software operates. Demonstrate the use of the tool bar drawing tools.
3. **TOOLS:**
 - Wacky Pencil** is used to draw free form line
 - Line** is used to draw straight lines
 - Rectangle** is used to draw different sized rectangle
to draw a perfect square, press the Shift key while using this tool.
 - Oval** is used to draw ovals in various patterns
to draw a perfect Circle, press the Shift key while using the tool
 - Wacky Brush** is used to paint with many options
 - Eraser** allows one to choose from a number of different sized eraser
 - Text from Keyboard** allows one to type the attributes of the shapes and solids

anywhere on the page at the placement of the cursor

Moving Van allows one to copy a selection and move it to another location

4. It is desirable for all students to have at least 20-30 minutes at a time at a computer to work on this project. Because the drawing of the figures requires some skill with a mouse, encourage the students to do as much drawing with the computer as possible. But, if they seem to be frustrated, remind them that they are only required to type the attributes on the computer and that they are allowed to draw the shapes freehand or with a template.

Assessment/Evaluation:

Student mastery of the content will be based on 80% achievement of the total possible points available. The total possible points will be determined by the teacher, who will inform students of the number/names of shapes or solids that will be required for the Geometric Technical Manual. Students who demonstrate skill above the required elements will be awarded additional points.

Content Rubrics:

- | | |
|-----------------------------------|------------------------|
| 1. Accurately labels shapes: | YES...2 pts. per shape |
| 2. Accurately illustrates shapes: | YES...2 pts. per shape |
| 3. Shows examples of congruency: | YES...2 pts. per shape |
| 4. Shows examples of symmetry | YES...2 pts. per shape |

General Expectations:

- | | |
|--|--------------|
| 1. Followed format, organized and easy to follow | YES...2 pts. |
| 2. Sentences complete | YES...2 pts. |
| 3. Correct mechanics (Spelling, capitalization, punctuation) | YES...2 pts. |
| 4. Neat and orderly, | YES...2 pts. |
| 5. Contains the correct number of shapes and figures | YES...2 pts. |
| 6. Completed on time | YES...2 pts. |
| 7. Manual is attractively designed and assembled | YES...2 pts. |

Sample of rubric distributed to students.

Geometric Technical Manual

Draw each of the following shapes on one page:

circle square triangle rectangle pentagon
hexagon octagon cube sphere cylinder
cone pyramid rectangular solid

Define the figures using the following terms:

plane solid faces angles corners sides

Show examples for each shape (if possible) of the following:

symmetry congruency

Your grade will be based on the following:

1. your definitions of the shapes
2. your lines of symmetry
3. your congruent shapes
4. your organization of the manual
5. your neatness
6. your use of proper grammar and punctuation

Name: Kathleen M. Lehman

School District: Belding Area Schools

School: Woodview Elementary

**Address: 450 Orchard Street
Belding MI 48809**