Chapter 6: AREA

The chapter Area will examine the area of various geometric figures. Each lesson will provide the students with the same given geometric figure, and students will discover the area of each using Geometer's SketchPad. Students will be asked to hypothesize for each lesson and record observations and conclusions throughout. Each lesson will stimulate critical thinking and problem-solving skills, which will then be assessed.

It is advised that the instructor initiate the first two lessons within this chapter to help stimulate prior knowledge of the mathematics being explored and of the functions of the GSP program itself. It is recommended that each lesson be assessed based on the conclusions made by each student. These written reports, along with oral discussion in class, will comprise the grade for each student.

LESSON ONE - Area of a Square

ONTARIO CURRICULUM Covered:

- Covered in the earlier grades expectations.

This introductory lesson to the chapter Area stimulates both problem-solving and investigation skills. Students will be expected to derive the formula for area using the animation feature within Geometer's Sketchpad. Students will independently investigate the measurements of a given square and then determine how GSP finds the area for the given image.

This lesson encourages critical thinking. Students are asked multiple questions regarding their discoveries. They will apply their knowledge of area to the questions asked within the GSP program itself. The GSP commands that will be used include measure, values, animation line and animation.

LESSON TWO - Area of a Rectangle

ONTARIO CURRICULUM Covered:

- Covered in the earlier grades expectations.

Similar to the previous lesson, Area of a Rectangle will require the students to derive the formula for area of given rectangle using the GSP animation feature. Students will determine the measurements of the figure and then proceed to discover the area.

This lesson also involves critical thinking and problem-solving skills. GSP commands that will be implemented include measure, values, animation line and animation.

Students will conclude the lesson by summarizing their investigations in their own words. This lesson will be assessed in accordance to their recorded observations and conclusions.

LESSON THREE - Area of a Triangle

ONTARIO CURRICULUM Covered:

- Grade 7: 7m63, 7m41, 7m47
- Grade 8: 8m42, 8m43

This lesson covers two strands of the Ontario Mathematics Curriculum: Geometry and Spatial Sense and Measurement. Area of both a rectangle and triangle will be studied. Many of the commands used in GSP have already be implemented, however, new commands such as hide lines and polygon interior will also be utilized.

Students will hypothesize the formulas used by the GSP program to calculate the area of a rectangle and triangle. They will then proceed to record observations from their images. This lesson is highly concentrated in problem solving and requires critical thinking on behalf of the students. Thus, it is recommended that the instructor initiate the activity while making allowances for the students to investigate the new commands and hypothesize on their own.

Area: Area is the amount of space within a specified object. The formula for area of geometric shapes differs

depending on the shape being examined.

LESSON FOUR - Area of a Parallelogram

ONTARIO CURRICULUM Covered:

- Grade 7: 7m41
- Grade 8: Used as an into to Volume.

This lesson connects with previous lessons, Area of a Square and Area of a Rectangle. It overlaps with the concept of area of a rectangle as students seek the area of a parallelogram using the same formula. The complexity of this lesson is comparable with previous lessons - it is high. The instructor should initiate the investigation using GSP.

Similar GSP functions will be utilized including: measure and animate. Students will be able to conclude the area of a parallelogram using GSP by the end of this lesson, and assessment will be created from the conclusions made.

LESSON FIVE - Area of a Rhombus

ONTARIO CURRICULUM Covered:

- Covered in the earlier grades expectations.

To conclude the chapter on Area, the lesson Area of a Rhombus will examine the GSP features previously used and will expand on them. Students will be asked to make predictions to determine the area of a rhombus, and will then record the conclusions from their investigations.

To conclude the chapter on Area, it is advised that instructors generate discussion on the discoveries made, to properly assess the level of understanding of both area and the specific GSP functions used throughout.