

**Teacher/School:** Sylvia P. Bandi

**Unit Title:** The Use of Technology in Mathematics

**Grade Level:** 6th Grade

**Subject/Topics:**

The MSP content from last summer's training that is incorporated in this plan is the use of technology Texas Instruments TI-73 Explorer overhead calculator

**Time Needed:**

The lesson can be taught in a regular class period (our class period 50 minutes).

**Learning Objectives:**      **What will students learn?**

The students will use models to derive formulas for finding area of two-dimensional shapes. They will understand the basic properties of geometric shapes and apply them to solve real-world problems.

**Sunshine State Standards:**

The Sunshine State Standards that are addressed in this lesson are MA.B. 1.3.1, MA.B.2.3.1 and MA.B.3.3.1.

**Materials/Supplies:**

Supplies needed are a Texas Instrument Model TI-73 Explorer (overhead calculator). Pencil and paper for the students. (The overhead calculator is necessary unless the teacher is fortunate enough to have a class set where each student can have their own.)

**Prerequisite Skills:**

The student must be able to compute two and three dimensional figures in an item that contains decimals. Students should also understand the concept of area and  $\pi$ . The students should understand how to develop the formula for circumference of a circle using  $\pi$  and diameter (how to develop diameter if only radius is given). Students should also need to understand that the exponent of 2 means to "square" a number (using the number as a factor 2 times) and not to multiply the number by 2. This skill will be used in the formula  $A = \pi R^2$ .

**Instructional Procedures:**

The lesson begins with teacher-directed activities. The teacher will first instruct the students in basic operations on the calculator to familiarize them with the instrument. This is vital as the lesson will focus on the APP key. This application will be reviewing the definition and area formula for not only the circle, but also rectangles, squares, parallelograms, triangles, and trapezoids. The development of the formulas will be explained using animation and examples of the calculation of the area will be given for each shape. The APP key has a section defined as follows:

- DEF - this will show the definition of each shape.
- AREA - this will show the formula for the area of each shape.
- WHY? - This is very important as it will use animation to show how to develop the area formula of the chosen shape.
- Examples- this will show several examples of how to apply the area formula.

Next, the students will be instructed in the procedure to use after the APP key is pressed. The student will then select Area Form by pressing the number next to Area Form. They can also scroll to highlight the number next to Area Form. They will then press (Enter). The student may press any key to scroll through the opening screens.

Next the student will select Definitions & Formulas and scroll to highlight and select Circles. The teacher should explain that the Soft Keys (Menu, Def, Examples, and Why?) which appear on the bottom of the Home Screen may be utilized by pressing any of the top row of keys (Y -, WINDOW, ZOOM, TRACE, or GRAPH). The student should first select the DEFINITION screen. By pressing AREA, the AREA screen will be displayed. Other examples may be chosen by selecting option EXAMPLE. Here the student will view other examples of area calculations for the specific shape.

Next the student should press the WHY? Key. This is very important because this option provides an animated explanation of the area formula. In the case of the circle, the animation will show the student the

logic of the area formula by cutting it into segments and rearranging them to form a parallelogram. After the teacher has demonstrated this process, students may then be given the opportunity to come up to the overhead and experience the procedure for themselves. The class will continue to take turns using the calculator. It is best if each student is provided his/her own calculator. The teacher will continue to assess understanding as each student takes a turn using the calculator.

WEB SITE: More practice can be obtained by the student by going online to [www.PHSchool.com](http://www.PHSchool.com) Web Code: aaa-O906. This site will provide both practice and assessment concerning the area of a circle.

**Differentiated Instruction:**

Learning will be accommodated for the ESE and ESOL student by assisting as the student works through the problem. It is benefit that the student can actually see the formula of the area of a circle being worked out in a visual format. The gifted student will also benefit from the visual effects. Often they enjoy the animation effects and are eager to try new formulas.

## Assessment

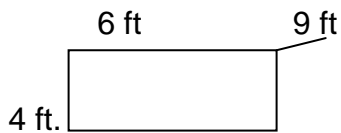
Because the circle is the one common geometric figure whose area is not related to many of the other geometric shapes, the students must be convinced the formula is logical.

Example of an assessment:

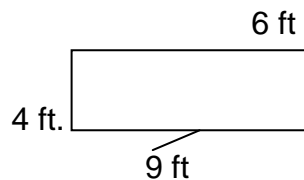
The Wilcox family has a new dog Fido. Since they have no fenced area in their yard, they plan to tie Fido on a 9-foot leash attached to a metal stake in the ground when he is outside. Where should they place the stake to give the dog the most space to roam?

- **Option 1:** At the corner of their 4 ft. by 6 ft. shed.
- **Option 2:** In the center of the 6-ft. side of the shed.

### Option 1



### Option 2



Student should show your calculations, sketches, and justify your conclusion.

The following rubric could be used:

Points	Assessment
4	Fully applies area concepts in a problem situation, with complete explanations.
3	Substantially applies area concepts in a problem situation, with adequate explanations.
2	Partially applies area concepts in a problem situation with written explanations.
1	Attempts to apply and explain area concepts in a problem situation.
0	No attempt or non-mathematical response.

Note: Other fun exercises are included ("Fast 4" -pg. 52; "Inner-Outer Areas" pg. 53; "Approximate Circle Areas" pg. 54, "Square A Circle" pg. 55, "Chocolate Chip Cookies" pg. 57, "Circles: Diameter-Area Relationships" pg. 58.

Other assessments included are: "Circle Areas" pg. 60.