Teacher Notes

The GSP sketch “Area of Simple Shapes” was designed as a tool for intervention or remediation for students having difficulty with the concept of area. The program targets formula re-development for the rectangle, square, parallelogram, triangle, trapezoid and circle. It is not intended to be used as a student’s first exposure to these formulas. It should be used with students, who after the concept has been taught, are still struggling. Since the sketch contains all of the shapes listed above it probably lends itself to best use in grade 9 mathematics. Although parts of the sketch could certainly be used in grades 7 and 8. It is also possible that a special education resource teacher or an educational assistant use this program for intense intervention with an individual student

The sketch starts with the rectangle and explores the concept of area and square units. The formula for the area of a square is developed as a special case of the rectangle. The formula for the area of the parallogram is developed by reconstructing it as a rectangle. The formula for the area of a triangle is developed by using two identical copies of the triangle to create a parallelogram. The formula for the area of a trapezoid is developed by using two identical copies of the trapezoid to create a parallelogram. The circle is reconstructed as a rectangle. In this manner, the sketch attempts to build on the prior knowledge of the student and to develop the new formula based on one that is already known and understood.

There are three types of screens in the sketch
i) blue - diagnostic testing
ii) green - formula development
iii) yellow - practice screens

The blue screens in the program are up-front diagnostic testing. A student will be asked to find the area of 3 different drawings of one shape. If the area of all three is correct a student will be directed to the next shape. An area is input by double clicking on the word area.

If the student gets at least one area incorrect, they will be led to the green remediation screens. It is in this group of screens that the formula is redeveloped. Once the formula has been redeveloped the student is directed back to the diagnostic testing screen. A student will only be allowed to move to the next shape when the diagnostic test is correct.

When a student has progressed through all of the shapes they will be directed to the yellow practice screens. These screens proceed in the same order of shapes as the rest of the sketch. The student will find the area of the shape and input their answer. The sketch will indicate whether or not the answer is correct. If the student so desires the “new shape” button will create another shape. In this manner practice will never be the same as the new shapes are drawn at random.

In some instance this might lead to an inconsistent sketch. Rounding of displayed measurements will give the impression that two dimensions are equal when this is not possible (e.g. height of a trapezoid is equal to one of the non-parallel sides). When this happens it is recommended that you explain the situtation that caused this inconsistency and proceed to a new shape.

Helpful Hints
1) Double clicking on the word area opens the edit parameter box. This box also functions as a calculator which allows a student to input their answer in the form of a numeric string (ie. ½ * 4 * 12). This eliminates the need to have either a calculator handy or need to use the calculator in GSP.

2) If the sketch is used for a whole class setting in a computer lab, the colour of the screens can assist a teacher in directing remediation efforts. If a student is on a yellow screen this indicates that they have successfully completed all of the diagnostic testing so they probably do not require much assistance. If a student is on a blue screen they are in the process of completing a diagnostic test. If a student is on a green screen they are having difficulty with a concept so these are the students which will require the most assistance.