Area - Time to Get in Shape

<---Sketch Title

PRISM-NEO

Sketch Filename: Area.gsp

Movie Filename: Area.mov

Math Concept(s)
Area

Suggested Grades
- ☒ 7
- ☐ 8
- ☒ 9 Applied

Sketchpad Level
Easy
- drag points and click buttons

Beginner
Intermediate
Experienced

Learning Goals:
- determine that the formula for the area of a triangle is 1/2(base)(height)
- determine that the formula for the area of parallelogram is (base)(height)

"Sketchy" Description:
This 8 page sketch includes
- an activity to relate the area of a triangle to the area of a rectangle through the use of a visual model showing that two congruent triangles can be combined to form a rectangle
- an activity to relate the area of a parallellogram to the area of a rectangle through the use of a visual model showing that a paralleogram can be reconstruted as a rectangle
- a demonstration that there is more than one base/height pairing in a triangle or parallelogram

Lesson Plan Suggestions

- description of how the sketch might be used in each of the three lesson parts - Minds On, Action!, Consolidate.
- includes student groupings, instructional strategies, and connections to manipulatives or other technologies.

Minds On
Have students work in small groups to use Jenny Eather's Math Dictionary For Kids to review the defintion of area. The site also includes activities and practice to review the concept of area. Groups can then complete a word wall card or journal entry for the definition of area of a rectangle

Action
Working with a partner or individually, students complete activities one to four to discover the formulas for the area of a triangle and a parallelogram. Ensure that students relate these two formulas to the formula for the area of a rectangle.

Consolidate
Bring several paper models of triangles and parallelograms. Have students work in small groups ro determine all of the possible base-height pairings possible for each shape. Have them take appropriate measurements to determine the area using all of the pairings (activity 3 and 4 can be used to show infinite models). Ensure students understand that regardless of which pair is chosen the area remains the same.

Extensions:
- Use the extension sketch to discover the effect on the area when the dimensions of a triangle are multiplied by the same amount (dimension factor). The students should discover that when the dimensions are all doubled, the area of the new triangle is 4 times the area of the original. When the dimensions are all tripled, the area of the new triangle is 9 times the area of the original. Ultimately, students may recognize that if the dimensions are multiplied by a factor of "a" then the area is multiplied by a factor of "a^2" (a squared)

Questions or activities for students/parents to explore together:
1. Find some interesting triangles or paralleograms in architecture. It may be possible to find these in your own home, magazines or while on a drive through the neighbourhood. Windows would make an interesting subject. Determine a method for finding the area of the shape.
2. Find two different triangles or parallelograms which have the same area. How do their dimensions compare?
3. Choose a value for area and then create a triangle/parallelogram using this area which has the smallest possible perimeter