Finding the Area of a Triangle

Curriculum connections

Australian:

Year 7

- Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (ACMMG159)

    - building on the understanding of the area of rectangles to develop formulas for the area of triangles

    - establishing that the area of a triangle is half the area of an appropriate rectangle

USA Common Core:

Grade 6

- CCSS.MATH.CONTENT.6.G.A.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Lesson Overview

Students investigate and devise a formula for the area of a triangle.

Lesson Objectives

1. Revise the formula for the area of a rectangle.

    - Draw a rectangle (to the grid) and use the mark up tool to show width and height.

    - Multiply the two to get the area in units squared.

2. Demonstrate that two triangles can be made by cutting the rectangle along a diagonal to form two right angle triangles.

    - Knowing the area of the rectangle, what would the area of the triangles be? Would they both be the same?

    - Yes, the area of each of these triangles is half the area of the rectangle because we cut the rectangle in half.

- But what happens with a scalene, equilateral or isosceles triangle? Can you find the area the same way?

3. Ask the students to draw a triangle, small enough that two will fit on the screen.

   - We will call this "Triangle 1".

4. Duplicate Triangle 1.

   - We will call the second triangle "Triangle 2".

   - Change the colour of Triangle 2 so the two triangles are different colours.

5. Place Triangle 1 in the middle of the screen using its longest side as the base.

   - Join the triangles at one of the remaining congruent sides.
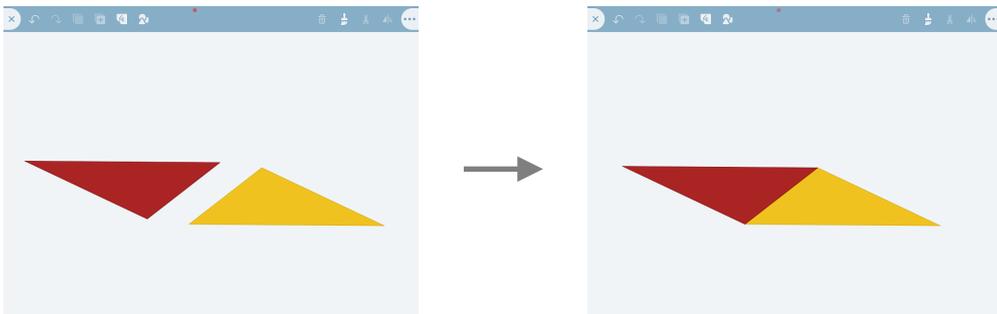
6. Cut Triangle 1 from the top corner to the base, to form two right angle triangles.
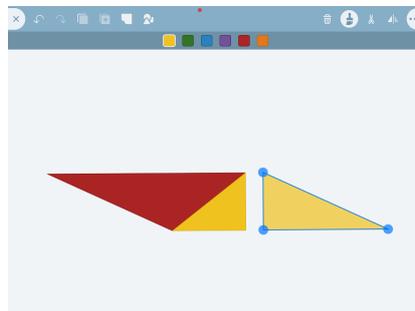
7. Then, move the cut piece of Triangle 1 over to the left so it sits underneath Triangle 2 to form a rectangle.
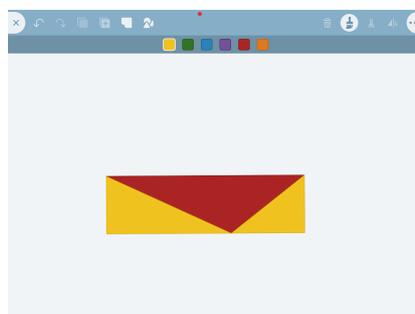
8. From here, knowing the formula for the area of a rectangle, you can deduce that, because you can make a rectangle from two congruent triangles, the formula for the

area of a triangle must be the formula for the area of a rectangle, divided by 2 i.e. *(b × h) ÷ 2.*

- Emphasise that one must know the *height* of the triangle, not just two sides.

9. Distribute the *Finding the Area of a Triangle* worksheet to students.

Resources

- iPads with Shape Lab installed.
- *Finding the Area of Triangle* worksheet.

Extension

- Can you find the area of a triangle if you aren't given the height? Why or why not?
- Can you use a similar method to find the area of a parallelogram? How?