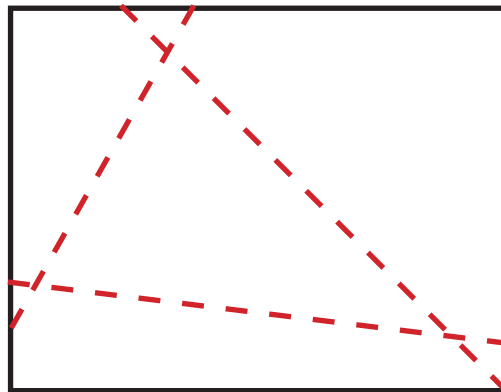# History of Geometry

Activity 3 - Measuring the Area
of a Triangle the Egyptian Way

People in ancient Egypt were very knowledgeable about mathematics. In fact, they were one of the first civilizations to make important discoveries in mathematics, particularly in geometry. Ancient Egyptians often used geometry in architecture and agriculture. Geometry was used in agriculture to help divide the land to make sure that each farmer got the right amount of land. In order to do this, Egyptians had to have an easy way of measuring areas of irregularly shaped fields. To acheive this goal, they marked off the land into big triangles and then measured the area of the triangles. Learn the Egyptian way of figuring out the area of a triangle below:

- Materials needed: paper and scissors
- Take a piece of paper (use the standard paper size) and make a triangle by folding the paper along the three creases as shown in the diagram with red dashed lines. Make your creases precise and sharp.
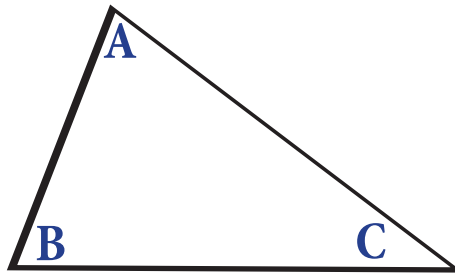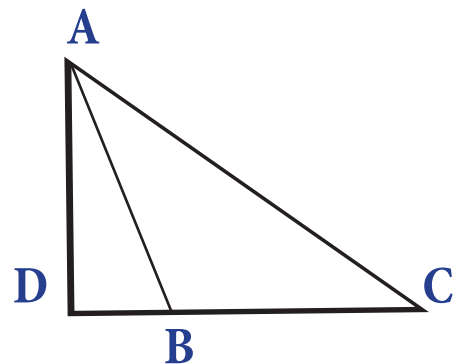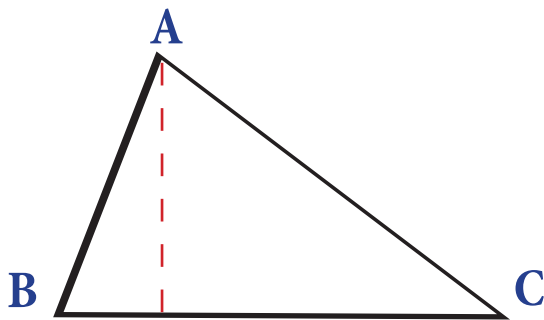

Can you believe THIS is math?

History of Geometry

Activity 3 - Measuring the Area of a Triangle the Egyptian Way - *continued*

- Unfold the paper and cut along the creases. Now you have the triangle.

- Label the triangle ABC, as shown in the diagram below:

- Fold the triangle through the vertex 'A' in such a way that the line BC is folded back along itself. The line which you have just created by the crease is called the altitude of a triangle. Label this altitude AD.
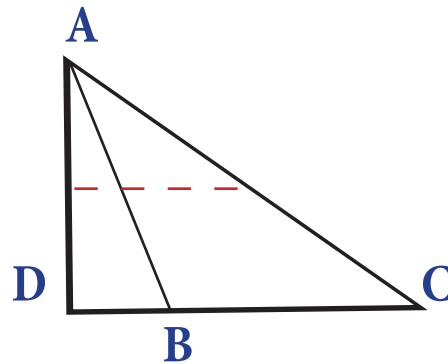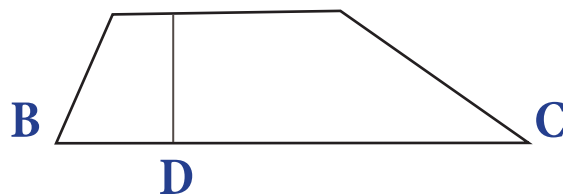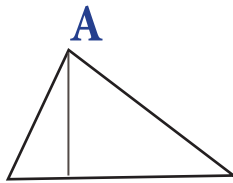
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History of Geometry

Activity 3 - Measuring the Area of a Triangle the Egyptian Way - *continued*

- Fold the triangle again so that A ends up directly over D. Make a sharp crease and unfold.

- Now cut along the crease, which you just made in the previous step. You should have two parts of the figure: a triangle and a trapezoid.
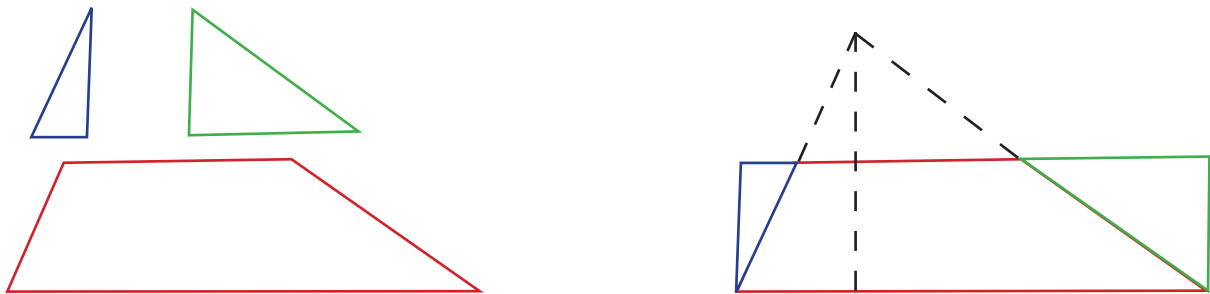
Can you believe THIS is math?

History of Geometry

Activity 3 - Measuring the Area of a Triangle the Egyptian Way - *continued*

- The grey lines in the previous diagram show the fold lines in the two parts. Cut the triangle along the fold line to make two triangles. You now have three parts of the puzzle: two smaller triangles and a trapezoid. Now rearrange the three pieces to make a rectangle.

- The area of the original triangle you had in the second step equals the area of a rectangle. The rectangle has the same length as the original triangle's base, but only half its height.

Egyptians knew how to easily find the area of the rectangle:

Area of the rectangle = Length x Height (or Width)

From here they could figure out the general formula for the area of the triangle.

Can you believe THIS is math?

History of Geometry

Activity 3 - Measuring the Area of a Triangle the Egyptian Way - *continued*

Questions:

1. Can you figure out the formula for the area of the triangle in terms of base and height, using the Egyptian method? Explain how you figured it out. Use the facts that the length of the rectangle and triangle are the same, but that the height of the rectangle is half of the triangle's height.

2. Use your formula to calculate the area of a triangle whose base is 10cm and whose height is 15cm. What is the area of the rectangle with length 15cm and height 10cm?

Can you believe THIS is math?