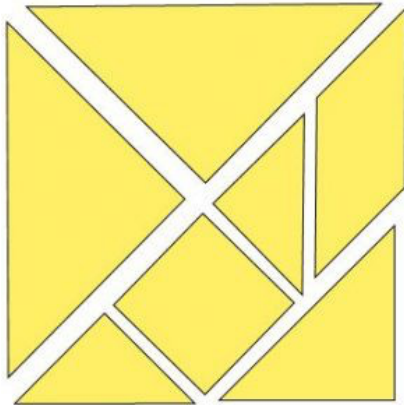


TANGRAM FRACTIONS



STARTER ACTIVITY FOR ALL AGES

In a group make the puzzle by folding a square (See the HELP section for instructions).

Play with the tangram pieces.

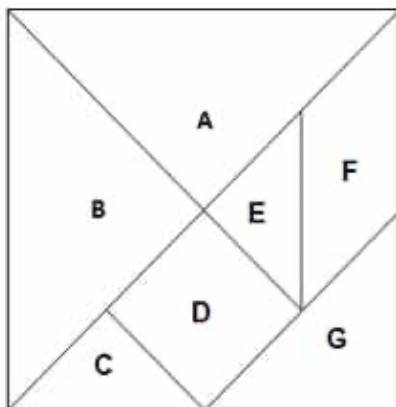
Create your own shapes.

This is a classic Chinese Tangram.

Each of the people illustrated, and many other shapes, can be made with the 7 pieces. There are hundreds of other puzzles based on this tangram.



Can you find a way to fold a sheet of paper so that you can cut out the tangram pieces accurately without any measuring?



FRACTIONS, AREAS AND PERIMETERS

Take the edge length of the square as 1 unit and the area as 1 square unit.

In pairs or groups talk about the areas of the 7 pieces. What fraction of the square does each piece make? Arrange the 7 pieces in order of their areas.

For secondary students: What are the perimeters of the 7 pieces?

Arrange the 7 pieces in order of their perimeters. Are these two orders the same?

Make a square from the pieces A, G, C and E. What is its area? What is its edge length?

How many different polygons can you make using all 7 pieces of the tangram?

TANGRAM FRACTION GAME

You will need 7 tangram pieces. Draw a square frame into which the pieces fit.

Make 8 identical fraction cards. Write $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{8}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{16}$ on 7 cards and leave one card blank. Put the cards in a bag or in a box and shake to mix the cards, or place the cards face down on the table and mix them.

Take the tangram pieces out of the frame. Each player (or team) in turn picks a fraction card, selects a tangram piece with area corresponding to the fraction on the card, notes the area, and places the piece in position in the frame. The winner is the player with the greatest total area when the 7 pieces are back in the frame and all 8 cards have been taken.

HELP MAKE YOUR OWN TANGRAM

The tangram can be made by folding a square of paper or thin card.

Bring vertices A and C together and fold to on the blue diagonal fold line.

To find the centre, **very lightly** crease on the green diagonal line without creasing the triangle at the bottom right.

Cut along the diagonal BD.

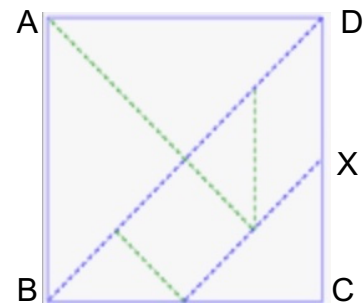
Cut along a green line to cut the large triangle into two more tangram pieces.

You now have three triangles and a trapezium.

Bring point X to the centre and fold along a green line to make a triangle and a parallelogram.

Bring point B to the centre and fold along a green line to make a triangle and a square.

Cut along these green fold lines and you will have 7 tangram pieces: a parallelogram, a square and 5 triangles.



NEXT

Can you make this little man with the umbrella?



Tangram 2D Shapes <https://aiminghigh.aimssec.ac.za/tangram-2d-shapes/>

A Bigger Challenge: There are only 13 convex polygons altogether that can be made using all 7 tangram pieces. Can you find them?

A polygon is called convex when all the interior angles are less than 180 degrees.

