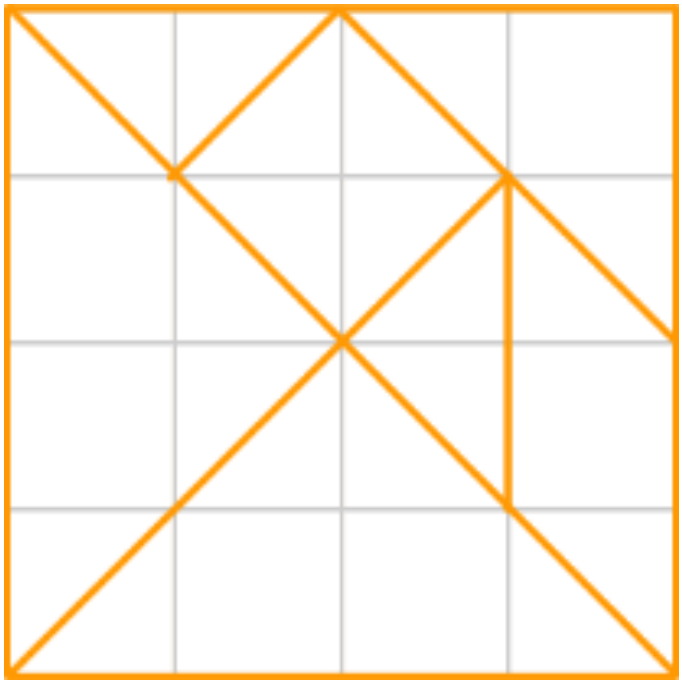
TANGRAM PATTERN

Arrange the 7 tangram pieces to make the pattern in the grey picture.

What do you notice about this pattern?

Describe the shapes of the tangram pieces.

What is the same and what is different about the shapes of the tangram pieces?

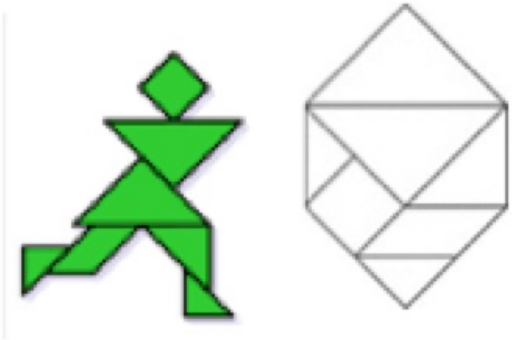


Make a pattern of your own using all 7

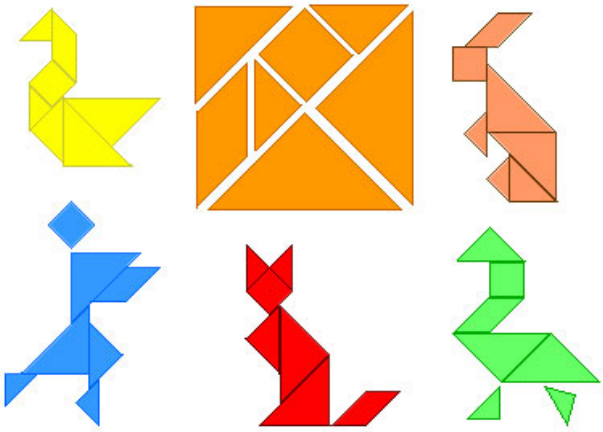
You can cut out your own tangram pieces to make the grey pattern.

Can you make some other symmetric patterns?

Here are some more patterns for you to make with the tangram pieces.



NEXT



Make these small pictures and make up a story about the two people, two birds, a cat and a rabbit. These puzzles are very easy as the outlines of the 7 pieces are shown.

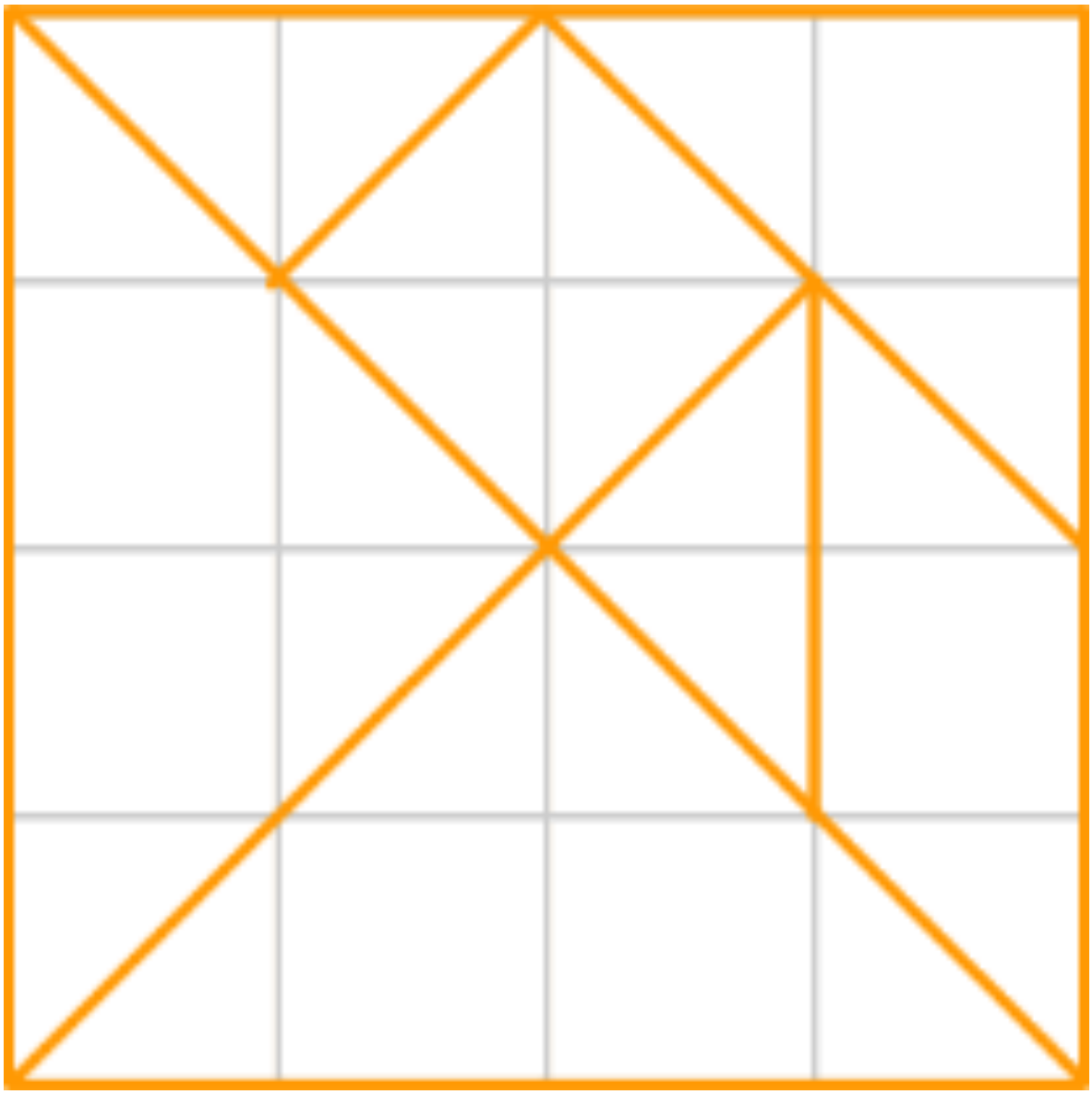
You might make a smaller tangram and use it for the animals and a larger one for the people and then make a poster that gives your story illustrated by the tangram pictures.

HELP

You can make your own tangram pieces from scrap card or plastic. Prick through the vertices of this template with a sharp pin to mark the vertices, then draw the edges using a ruler, then cut out the 7 pieces.

Alternatively, you can make a tangram by folding a square of paper or thin card.

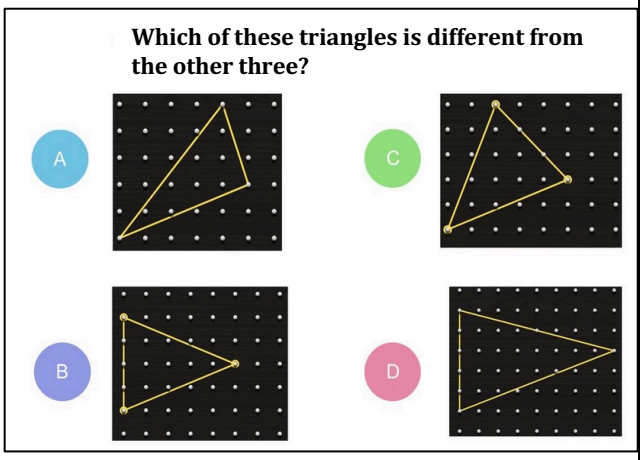
See the video with instructions for making a tangram puzzle by paper folding.



NOTES FOR TEACHERS

Diagnostic Assessment This should take about 5–10 minutes.
Write the question on the board, say to the class:
"Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 for D".

1. Notice how the learners respond. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
2. It is important for learners to explain the reason for their answer because it helps them to sort out their ideas and to develop communication skills.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.



4. Ask the class to vote again for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.
   A. is the correct answer because the triangle is not symmetric.

https://diagnosticquestions.com

Why do this activity?

This activity is very open ended and so all learners should experience success in making the patterns, creating their own patterns and observing the geometrical properties. The activity is designed to lead to spontaneous discussion of symmetry and teachers can pursue this as far as they think appropriate for their class. To make the puzzles easy for young learners they are given showing the individual pieces (actually solutions to the puzzles). The template shows a background grid to facilitate drawing it and also to suggest other questions that can be asked about the individual pieces.

Learning objectives

In doing this activity students will have an opportunity to develop:

- recognition of triangles, squares and parallelograms;
- understanding of similarity and scale by comparing the triangles;
- understanding of line symmetry.

Generic competences

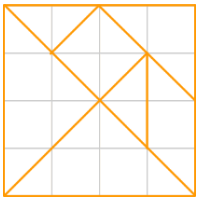
In doing this activity students will have an opportunity to develop ideas of symmetry and notice how symmetry appears in nature, art and design.

Suggestions for teaching

Start with the diagnostic question. Rotate the triangle so they can see it in different positions. Ask "What is the same about the triangles B, C and D and what is different?"

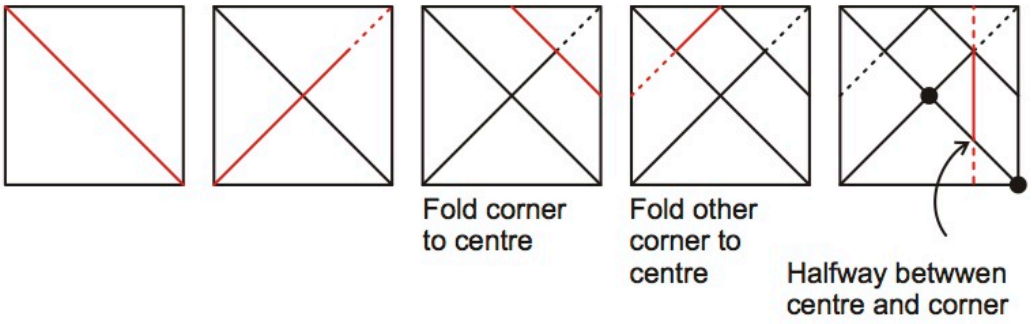
The answer is that "They are all isosceles triangles with mirror symmetry but they are different sizes."

Either give each learner

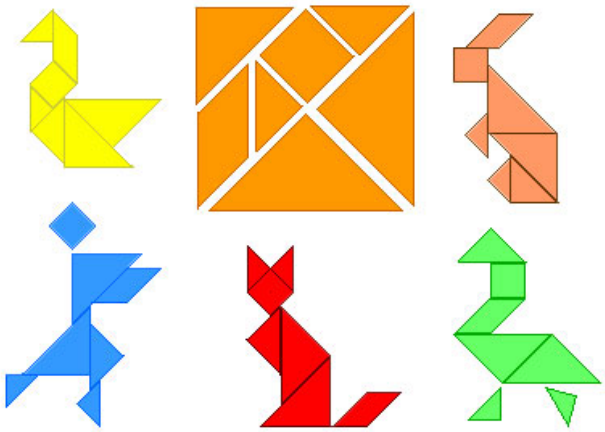


1. a set of tangram pieces or
2. a copy of the template to cut out or
3. A square of paper and help them to make their own tangrams following the instructions below.

Here's a simple way to make a Tangram without any measuring or ruling lines. All you need is a square of paper and some scissors to cut out the shapes when you've finished folding. Follow the steps shown in each diagram and remember that every fold you make is finding half of a shape or line.



Draw the grey pattern on the board and ask the learners to make it with their pieces. Ask the learners what they notice. You might like to record their observations on the board. Ask the key questions. Build on what the learners say helping them to learn the correct mathematical language in which to express their ideas.



Choose how far to pursue the discussion of symmetry and reflections and also discussion of similarity between the triangles. For example: the edges of the largest triangles are double the edges of the smallest triangles so they are *similar* with a *scale factor 2* and one is an *enlargement* of the other.

Give the learners the other puzzles to make of the people and animals in the diagrams given here and ask them to make up stories about them. The learners will enjoy this and it will help them to develop their visualisation of shapes and their properties.

Key questions

- What do you notice about the grey pattern?
- How many different shapes do you see in the grey pattern? What are they called?
- Look at the 5 triangles – what is the same and what is different about them?
- Look at the square and the parallelogram – what is the same and what is different about them?
- Where is the mirror line in the grey pattern?
- How have you made two parallelograms in the grey pattern?
- Look at your two hands in front of you. What is the same about them and what is different?

Follow up

You might like to follow on with
Tangram 2D shap**es** https://aiminghigh.aimssec.ac.za/years-7-9-tangram-2d-shapes/

Tangram Fractions: https://aiminghigh.aimssec.ac.za/years-6-10-tangram-fractions/