

AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES

SCHOOLS ENRICHMENT CENTRE (AIMSSEC)

AIMING HIGH

TANGRAM 2D SHAPES

To make your 7-piece Tangram Puzzle, either make your own tangram pieces from scrap paper as shown in this video:



https://youtu.be/11 U31PIfLQ or use this diagram and carefully cut out the pieces. Now use the pieces of your Tangram to make the following shapes:

- Isosceles triangle
- Rectangle
- Parallelogram
- Isosceles trapezium
- Pentagon

HELP



Cut out the 7 pieces for this tangram puzzle. Can you fit them into this rectangular box without gaps and without overlapping?

Now try to make the other shapes.

NEXT

Four equilateral tiles are put together to make a new shape. Which shape is impossible to make?

- a) Irregular hexagon
- b) Parallelogram
- c) Isosceles trapezium (four equilateral triangles cannot make an isosceles trapezium)
- d) Regular triangle

NOTES FOR TEACHERS



DIAGNOSTIC ASSESSMENT

The quiz should take about 5–10 minutes and can be used before or after the lesson. 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 fingers for D".



1. Notice how the learners respond. Ask a learner who gave answer A to explain why he or she gave that answer. DO NOT say whether it is right or wrong, simply thank the learner the answer.

2. It is important for learners to explain the reasons for their answers. Putting thoughts into words may help them to gain better understanding and improve their communication skills.

3. Then do the same for answers B, C and D. Make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.

4. Again ask the class to vote 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.

The correct answer is **B**

- A.Two axes of symmetry cannot be a square as it has four axes of symmetry.
- C.A Decagon has 10 sides.
- D.A hexagon has 6 sides.

https://diagnosticquestions.com

Why do this activity?

This activity encourages learners to think about the properties of certain 2D shapes and use this knowledge to build those shapes from the pieces of the tangram. It deepens their understanding of those geometrical properties as a result of this. The activity is designed to lead to spontaneous discussion of how to make the shapes from these pieces.

Learning objectives

In doing this activity students will have an opportunity to:

- learn to recognise two-dimensional (2D) shapes and to notice their properties;
- develop understanding of the properties of 2D shapes.

Generic competences

In doing this activity students will have an opportunity to:

- think flexibly, be creative and innovative and apply knowledge and skills;
- **visualize** and develop the skill of interpreting and creating visual images.

Suggestions for teaching

Resources: Scissors to cut out the tangram pieces.

Start by showing the learners pictures of the two-dimensional shapes they have to make from the tangram. Ask them to identify the shapes. Ask them to tell you about as many properties of those shapes as they can. Get the learners to discuss what we mean by regular and irregular shapes.

Ask the learners to try and make the isosceles triangle from the pieces in the tangram. If some learners are finding this difficult give them an outline of the isosceles triangle and ask them to fit the pieces into the triangle with no spaces.

Continue in this way until all of the shapes are made. Through asking questions establish the shapes that have been made.

Key questions properties of the

The shapes are all made from the same pieces.

- What is different about the shapes you have made?
- What is the same about the shapes?
- You say the shapes are made from the same pieces, what does that tell you?
- You say the shapes are made from the same pieces, what does that tell you?
- Can you tell me anything about the areas of the shapes that you have made?

Follow up

World of Tan - <u>https://nrich.maths.org/14074</u> A collection of 30 stories by Lyndon Baker about Granma T, who owns a removals business in China. Here you will find a series of stories relating to Granma T, her grandchildren and colleagues, each one accompanied by one or more interactive tangrams. Join the Tan family on their adventures and enjoy creating different pictures from the seven tangram pieces.

Tangram Pattern (symmetry)

https://aiminghigh.aimssec.ac.za/tangram-pattern/

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