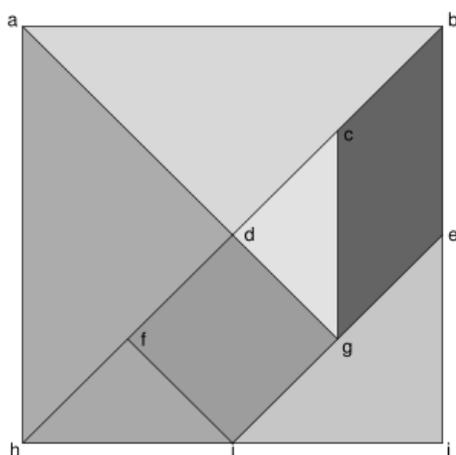


## "Kingdom in mathematics"

### *The legend of the puzzle „Tangram”*

A long time ago in China, there lived a man called Tan. Tan's greatest possession was a fine ceramic tile. One day Tan was carrying his tile to show the emperor. He tripped and the tile fell and broke into seven geometric shapes: two large triangles, a medium size triangle, a square, and a parallelogram. Tan spent the rest of his life trying to put the tile back together again. He was not successful, but he did succeed in creating many different geometric designs. Tan enjoyed creating the designs. His friends also enjoyed trying to recreate his designs. Tan's puzzles, later called tangrams, were passed on through generations and from country to country. Tangrams are perhaps the oldest and most enduring of all geometric puzzles.

The other one legend has it that the original tangram came for the Far East. It was a pane of glass in the shape of a perfect square. The king wanted the glass to be brought to his palace on the far side of the kingdom so he sent word that the smartest sage in all of the lands should make the journey. The sage had great respect for the king so he quickly ran to fetch the glass. The sage put the glass pane on his back and set out on the long and treacherous journey. He travelled for a long, long time and over a long, long distance. He rode a horse across the greenest of planes. He rode a camel across the driest of deserts and sailed a ship on the roughest of seas until he came to the meanest of all mountains. He had no choice but to climb. So he stepped up to the first few rocks and began. He strived for days on end until he was so tired that his foot slipped and he tumbled down the steep slopes. The glass pane came loose and fell through the air. The sage made a mighty effort to save the pane but it smashed against the rocks. When he finally came to rest he quickly checked the glass pane. Amazingly the pane had broken into seven even pieces. The sage struggled to put the pane back together again. By the time he had found a way to put all the pieces back into the original square he had discovered that the shapes could be rearranged into hundreds of exciting pictures. He put the pieces back onto his back and continued on his journey. When the sage finally arrived at the palace the king was anxious to see his treasured glass pane. The sage knelt down and showed him the broken mess. The king was horrified. But then the sage showed the king all the wonderful shapes that could be made. The king was delighted, and so tangrams spread throughout the realm...



### *Tangrams- the easy way to develop mathematical and thinking skills*

Tangrams is an ancient art. Tangram is an Chinese puzzle comprising seven pieces (tans) of three geometric shapes – two large, one medium and two small triangles, one square and one parallelogram. In Chinese this puzzle is called ch'i ch'iao t'u. This translates to „ingenious-puzzle figure of seven pieces”. Tangrams can be used as a puzzle, where the seven pieces are arranged to make an almost-endless variety of objects, such as people, animals, letters, etc. The rules of

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play are that you must use all seven tans, they must lay flat, they must touch and none may overlap. At the easiest level, you can simply place the pieces onto the patterns; at the most difficult, only a silhouette of the object is shown and you have to recreate it using the Tangrams. They can also be used in a more creative way to make your own designs.

There are many benefits to playing with Tangrams. They can be used to develop problem-solving and logical thinking skills, perceptual reasoning (nonverbal thinking skills), visual-spatial awareness, creativity and many mathematical concepts such as congruency, symmetry, area, perimeter, and geometry. Most crucially, perhaps, is the change of perspective of maths being something boring to becoming a creative and fun activity, leading to a desire to tackle more advanced maths.

### *Stages of learning the play "Tangram" in kindergarten and preschool*

**1<sup>st</sup> stage: Creating a figure by a method – Laying over a design.** The 1<sup>st</sup> stage of the play "Tangram" uses many exercises which develop into children three-dimensional ideas, elements of geometric imagination and acquiring practical skills in creating new figures on the way of adding one or other geometric figure. At the beginning we may offer to a child to count all the details of the play, to find a definite figure or to compare the figures according to exact sign. In this way the child can create new figures of 2-3 elements. For example: 2 triangles form a square or a trapezium or to add details one to another. Children can see how is created a mushroom, a house, a green tree, a sweet or etc.

**2<sup>nd</sup> stage: Creating a figure by a pattern.** This stage is very important in acquiring the skill to analyze the pattern and verbal expression of the way how to set the parts of the figure. The samples of the silhouettes are used in which the geometrical figures are separated. The children work with all the elements of the play, creating the image of a known animal- a rabbit, a fox, a bird, a bear.

**3<sup>rd</sup> stage: Creating a figure by outline image.** Creating a figure by outline image in which the geometrical figures are not separated. The children have to separate the figures by watching them. Only children at the age of 6-7 can take part in this play. At the beginning is necessary to be done cooperative analysis, which figures were used in the image of: running goose (its head or neck).

**4<sup>th</sup> stage: Creating a figure by personal idea.** The children create their own idea but in advance they think how to set the geometrical figures.

### **References:**

Trish Boschetti- "Cluster Coordinator Phase 1 – Maths for Learning Inclusion"

[www.Babylessons.ru](http://www.Babylessons.ru)

З.А. Михайлова - "Игровые и занимательные задачи для дошкольников", Москва "Просвещение", 1990

Enchanted Mind - "History of Tangrams"

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