

REPORT

Math-GAMES at FPA BENIASSENT

During the 2nd year of the European Erasmus+ Project *Math-GAMES*, the teacher's staff in the adults school FPA Beniassent decided to test the curricular materials while developing the Guidebook.

For this purpose we organized two courses with two different groups of adult students with a low level in mathematical skills.

Group A

Adult students with learning difficulties trying to get the Secondary School Degree in second opportunity (aged from 18 to 45 years old)



Group B

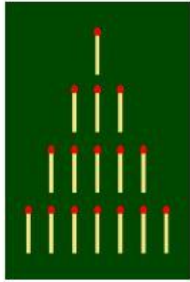
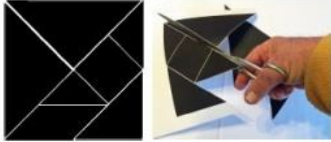



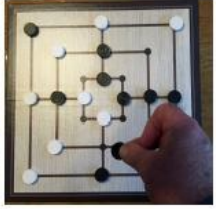


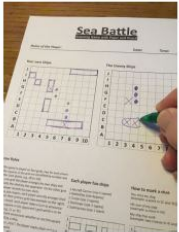
Senior students (from 50 years old onwards) learning basics in reading, writing and calculating. Most of them have never gone to school and some stopped going very early, at the age of 7-8.



During a lesson, the students learned about the game by reading a summary from the book Math-GAMES Compendium. The teacher also explained the main rules of that game and they all discussed about its characteristics and its history.

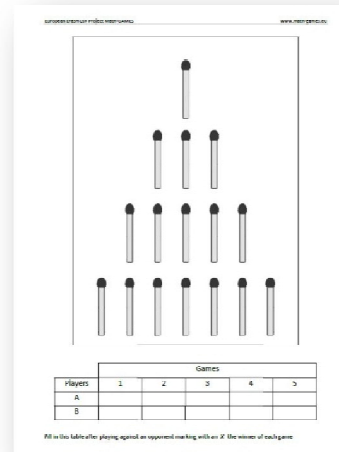
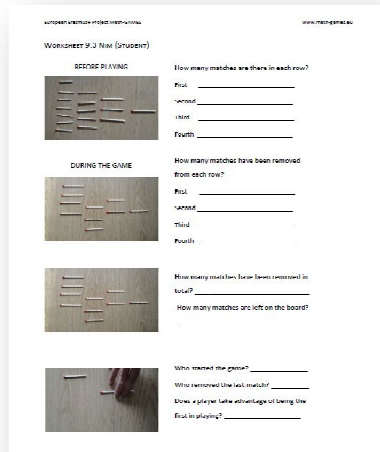
Sometimes the students needed a previous preparation to play the game by knowing the essential mathematical contents of the game. This happened especially to the students in *Group B*. In this case, we started the lesson doing some extra exercises.

From October to December we had 8 sessions in both groups. The games for the lessons were *Nim* (9.3.), *Tangram* (1.4.), *Seven and half* (9.2.), *Nine men's Morris* (1.1.), *Fifteen-game* (9.1.) and *Sea Battle* (1.5.).

<p>9.3 NIM GAME</p> <p>Nim is an ancient game of obscure origin, in which two players alternate in removing objects from different piles, with the player who removes the last object winning in the normal play variant and losing in another common variant.</p> <p>OVERVIEW</p> <ul style="list-style-type: none"> • Genre: mathematical game of strategy • Players: 2 • Age range: older than 7 • Setup Time: less than 1 minute • Playing Time: 1-2 minutes • Random Chance: none 	<p>1.4 TANGRAM</p>  <p>The tangram is a dissection puzzle consisting of seven flat shapes, called tans, which are put together to form shapes. The objective of the puzzle is to form a specific shape, when given only an outline or silhouette (left picture), using all seven pieces, which may not overlap. The solution is shown on the right picture below.</p> 
<p>9.2 SEVEN AND A HALF</p> <p>This is a Spanish card game, played with the standard Spanish deck of forty cards.</p> <p>OVERVIEW</p> <ul style="list-style-type: none"> • Genre: card game • Players: any number of players may take part in the game, but it is not recommended to be more than 8 • Age range: older than 5 • Setup Time: about 30 seconds • Playing Time: 1-2 minutes • Random Chance: rather high 	<p>1.1 NINE MEN'S MORRIS (MILL)</p>   <p><i>Nine men's morris or Mill is a very old game, to be played outside or on a table board.</i></p>
<p>9.1 FIFTEEN GAME</p> <p>The 15-puzzle is a game of sliding pieces that have a specific initial order within a square box.</p> <p>OVERVIEW</p> <ul style="list-style-type: none"> • Genre: sliding puzzle • Players: 1 • Age range: from 8-9 years old • Setup Time: less than 1 minute • Playing Time: depending on the ability of the player • Random Chance: none  	<p>1.5 SEA BATTLE (BATTLESHIP)</p>  <p>The game "Battleship" or "Sea Battle" is a game, which was played by generations of students in boring lessons with their neighbours. One needs only a piece of paper and you're able to play. It sounds like it is a war game, but it is just a guessing game, in which people can learn and use coordinates.</p> <p>OVERVIEW</p> <ul style="list-style-type: none"> • Genre: Guessing game • Players: 2 • Age range: older than 10 • Setup Time: less than 1 minute • Playing Time: about 10 Minutes • Random Chance: none, no dice needed

Nim

The students in both groups learned to play the game in one session. After doing the worksheet, we realized that some of the questions were not very clear, so we proceeded to make some changes in the worksheet.



The evaluation was positive; the mathematical objectives were completely achieved and further, they enjoyed playing the game.

Group A

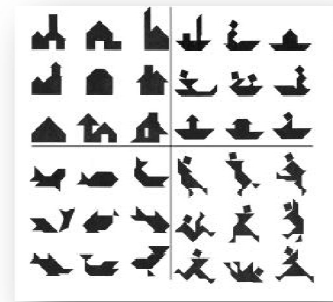
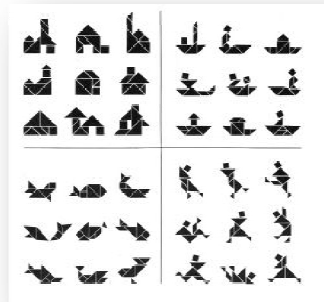
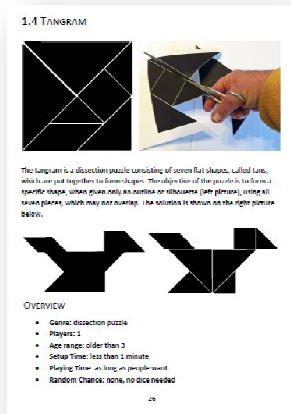


Group B



Tangram

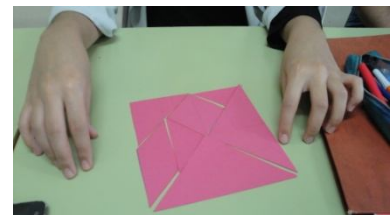
The students in both groups needed two sessions for this game. In the first session they constructed the *tangram* by themselves and they cut the pieces or *tans*. In the second session they played the game trying to form the shapes in the template.



The students in both groups could make easily the forms separated with lines (template on the left), but they had a lot of trouble to set up the figures without lines (template on the right).

Anyway, the evaluation of the students was positive; the objectives for this game were achieved.

Group A

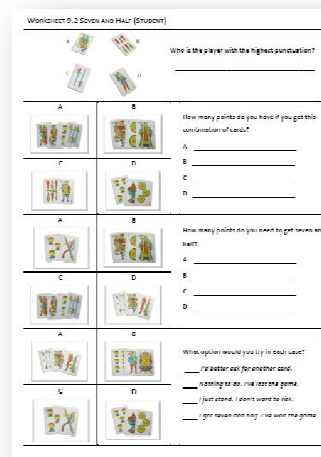


Group B



Seven and half

This game was played only in Group A. The objectives in this game didn't fit with the curriculum for the students in Group B. At any rate, it was difficult for the students in Group A to understand how to play the game. Although the process of the game is easy to learn, they couldn't understand well the concept of probability, when they should or should not risk.



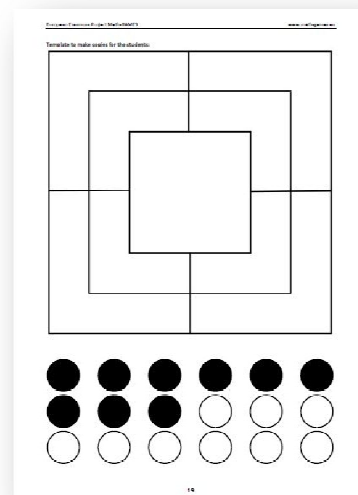
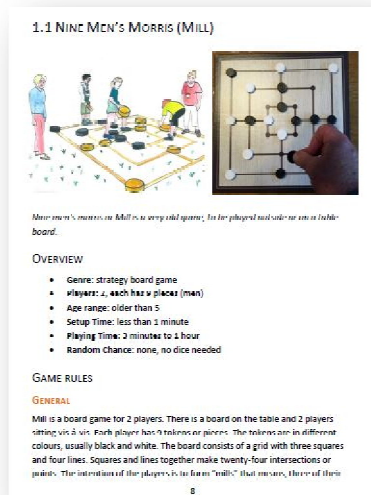
They had fun playing and the evaluation was positive although the objectives weren't completely achieved.

Group A



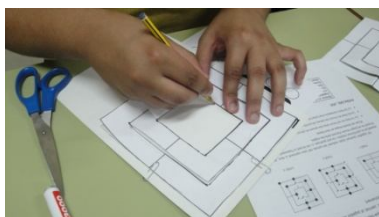
Nine men's Morris

We needed two sessions with both groups to complete this game. In the first session they constructed the board and the tokens. In the second session they played the game several times until they learned the procedure.



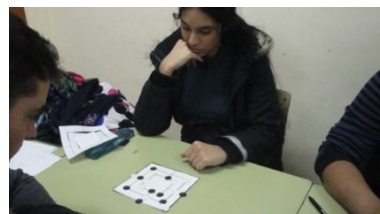
During the first session they had to measure, draw, cut... They learned a lot about geometry and everyone constructed its own board and tokens.

Group A



During the second session they used one board for each couple of players and they were playing once or twice; then they changed their opponent and played again. Eventually, they understood the rules of the game and they had fun playing the game.

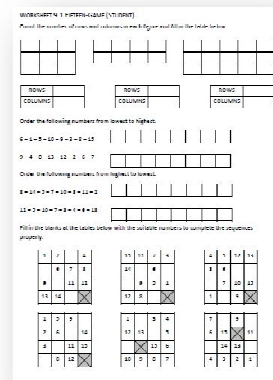
Group A



Group B

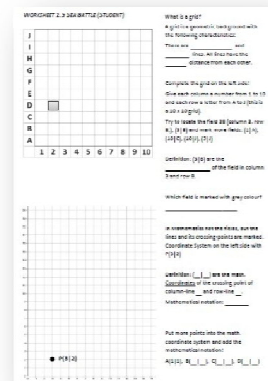
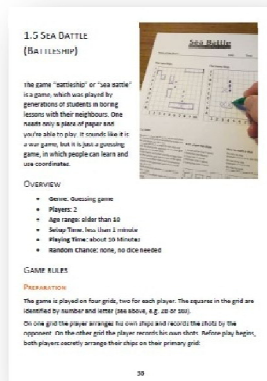


The evaluation of this lesson was very positive; all the aims were accomplished.



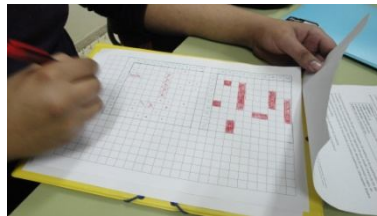
Sea battle

This game was played successfully only in Group A. After trying to play it in Group B we realized that the students in this group didn't understand well the system of coordinates so they were not able to find a point in the grid. Even some students in Group A had problems to write down the *ships* sunken to the opponent.



The evaluation was not completely positive; the objectives were partially achieved.

Group A



Carry on with Math-GAMES

These courses are not yet finished. We will continue playing some other games during the school year. It's planned to have 12 more sessions from January to May. The students will play at least 8 different games more. All the objectives from these games are established in the curriculum of Mathematics subject.

It has been proposed to the students in these groups to participate in the Cultural Week of the school, which will take place in February, organizing a workshop open to all the visitors inviting them to play the games they have already learned.

The final purpose of doing these courses is the integration of the didactic materials collected in the Math-GAMES project in the educational programming for learning mathematics in the future school years, mainly for the attention of the students with lower skills.

