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# INTELLECTUAL OUTPUT 1

# MATHEMATICAL CREATIVITY

4 Creativities Project
№2019-1-BG01-KA201-062354

## INTRODUCTION

The aim of FCREATIVITIES project is to improve the teachers' abilities to generate a creative education, leading to the creation of students who are able to think, analyze and solve daily problems. With the following six activities we aim to equip the teachers with some easy to implement, fun to organize exercises to be used with **10 to 12 year old students**, focusing on enhancing their motivation, logical thinking and mathematical creativity. The very nature of mathematics provides a suitable platform for developing creativity. Mathematical creativity could be defined as the process that results in unusual and insightful solutions to a given problem, irrespective of its level of complexity. Mathematical creativity is observed when one generates a non-standard solution for a problem which may not be solved so easily using the conventional methods.

### Title of the activity

***Hammering numbers***

### Description

This two-part activity consists of learning how to deal with whole numbers, how to put them in order and how to do calculations with them, knowing the rule of signs. To do this, the teacher will use homemade materials such as cardboard counters, two cardboard boxes and ping-pong balls or round counters.



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## Aims

1. Students will learn what integers are.

2. Students will learn to order a set of numbers from highest to lowest and vice versa on the same horizontal axis.

3. Students will practice verbal mathematical communication since they will have to refer to those integers.

4. Students will learn the rule of signs in multiplication of integers.

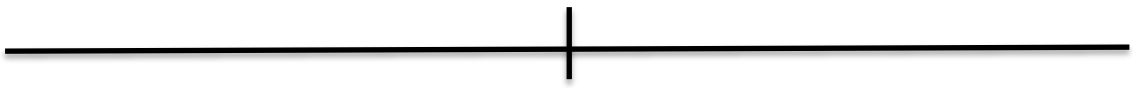
## Steps we must follow

1. Firstly, the teacher will describe briefly what an integer is: *It is a whole number from the set of negative, non-negative, positive and 0 numbers.*

Then the teacher give each student a set of cards with integers written on top:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -3 | 10 | 0 | -1 | -10 | 7 | -8 | -6 | 4 | 3 |

2. Students must paint a long horizontal line in front of them and cut it in half as shown below:



3. Student should now arrange the numbers from the cards in order above the line from smallest to largest. Them, they will assign a colour to each one, depending on whether they are negative or positive numbers. Negative ones will be red and positives, blue. Zero should be neutral so no colour is assigned to it.



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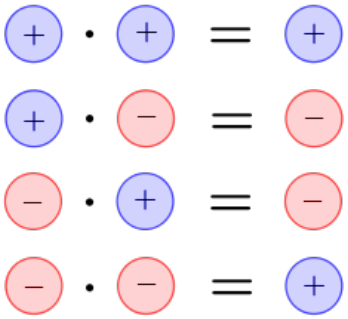
4. The teacher shows the students the following worksheet, which it is advisable to print out and laminate so that students can refer to it whenever they need it:

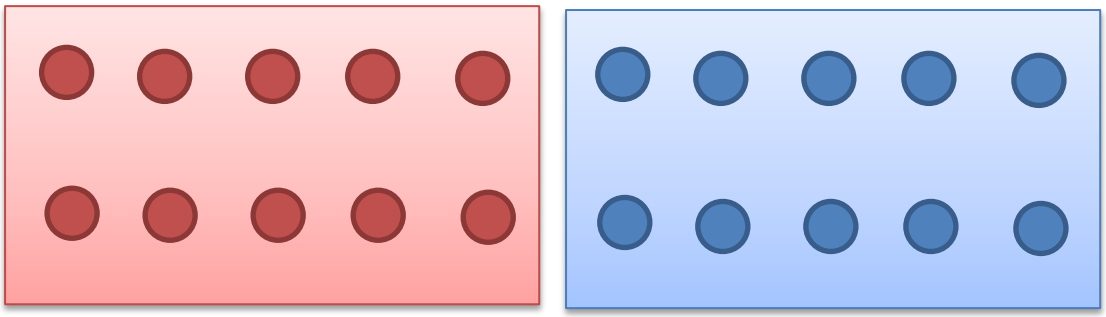



5. The teacher again hands out cards with mathematical calculations using the numbers that the students have arranged on their horizontal line.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| -8 + 4 | 1 x (-6) | 0 - 7 | -1 x (-10) | 3 + (-8) | -6 – (4) | -1 x (-3) | 7 x 0 |

6. Before solving the calculation, the student must apply the rule of signs. If the result is positive, the student will know that the balls to be removed with the hammer correspond to the box on the right, painted in blue. If the result is negative, the balls on the left side of the box must be removed by the student.

7. Finally, each student of the class will go to the cardboard box to solve his or her calculation and hits the balls in the corresponding box. The teacher checks whether they have got it right.





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## Materials (if needed)

→ Paper tokens (plus lining paper, if possible, to laminate the cards)

→ 2 cardboard boxes (one will be painted in red for the negative numbers and the other in blue for the positive ones)

→ Toy hammer (or hands)

## Tips

The game here is presented with a closed number of cards. The calculations do not exceed the number ten because of the space limitations of the cardboard boxes, but teachers can use 4 more boxes (2 in red and 2 in blue) with ten holes each for the students to improve their mathematical knowledge and raise the level of difficulty. Likewise, materials are also exchangeable as explained above.



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