ThunderHawk: A game of strategy and logic.

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Abstract

This document describes the game ThunderHawk, intended for use in the first and second cycles of basic education (1st to 6th grade). The game was developed as didactic material to reinforce the fundamental operations of addition and subtraction.

Keywords: educational games, learning strategies, classroom activities.

Exploring the Didactic Material: An In-depth Analysis

ThunderHawk is a two-player game. Each player has 24 chips of a different color (green and blue), and the moves of each player are determined based on the result obtained on the abacus under the following rule:

Figure 1. Abacus that defines the movements of the players in ThunderHawk.

- The player with the green-colored coins can make a move if the result of the addition is even. Figure 1 clearly illustrates this, as the sum obtained is 6+11=17, so the player won't be able to move.

- The player possessing the blue coins may execute a move if the outcome of the subtraction yields an odd number. For instance, as demonstrated in the illustration, the subtraction result 13-3=10 is an even number, hence they will not be eligible to moves.

Regarding the educational standards associated with the players' mobility rules in (Secretaría de Educación SE., 2009, pp. 18-20), the following is mentioned in the estimation block as well as in numbers and operations for first and fifth grade, respectively.

1. Students achieve reasonable estimations of counting, additions, and subtractions, with results less than 20.

2. Acquire the ability to determine the least common multiple and the greatest common divisor of two cardinal numbers.

Among the conceptual contents for the standard of least common multiple and greatest common divisor, one finds defining even and odd numbers. Thus, it becomes evident that in fifth grade, the notion of even and odd numbers is introduced.

After establishing the movement rules in the game, the game board is defined in ThunderHawk, which is the same vertical standing shelf used in Hasbro's Connect4 game. As expected, the player who first manages to form a horizontal, vertical, or diagonal line with 4 coins will be the winner. In this regard, (Murphy, 2017) states that Connect4 revolves around building a line while simultaneously preventing the opponent from constructing a line (See Figure 2).

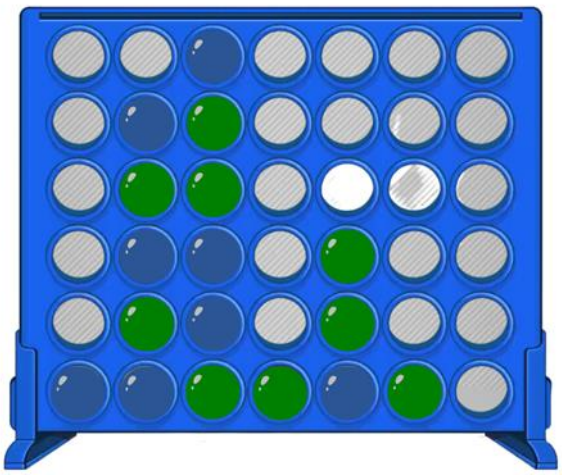

Figure 2. Game board in ThunderHawk (Vertical Standing Shelf in Connect4).

It is readily inferable, therefore, that in order to execute a winning strategy in Connect4, a grasp of line formations in a non-routine context is imperative. In this regard, in accordance with (Secretaría de Educación SE, 2009, p. 20), students are required to exhibit proficiency in the line's category, encompassing the following delineations

a. Recognize and name different types of lines: open, closed, etc.
b. Recognize and name horizontal, vertical, and slanted lines.
c. Apply types of lines in daily life activities.
d. Identify segments of straight lines in plane figures.
e. Identify and draw parallel and perpendicular lines.

Conclusions

ThunderHawk is a game designed to reinforce addition and subtraction operations taught in the first cycle of basic education. Furthermore, it aims to enhance the knowledge related to the 'lines' block, which, according to (Secretaría de Educación SE, 2009, p.20), is addressed in the first cycle and further continued until the first year of the third cycle of basic education. Therefore, it is crucial to strengthen these concepts whenever possible during the second cycle of basic education. As a didactic resource in the classroom, the game can be utilized to meet the standards and requirements of the blocks, as well as to challenge students' ability to develop winning strategies.

References

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