

# Math Games With a Purpose

- Mary Beaton

One of the goals we try to achieve with our mathematics program is to make students learn to think creatively about mathematics. To achieve this goal, students should have opportunities to play mathematical games. There are a number of games available that foster critical thinking.

Commercially made games can be used to greater advantage in a school if they are stored in the materials center rather than in individual classrooms. The games can be brought to each classroom to enrich specific topics. Games increase understanding of mathematical concepts and add variety to a unit of work.

Three different games are based on the formation of equations. In order of difficulty, these games are *Heads Up*, *TUF*, and *Equations*. All of these games can be played at various levels. They all require cubes marked with numerals or operational signs and one or two timers. *Heads Up* requires the players to form equations in a stated time. The game of *TUF* can be played at many levels of difficulty according to how many and what color of cubes are used. Cubes marked with square root signs and logarithmic signs may be used to increase difficulty level. Players compete to form the equation containing the greatest number of blocks or to use all of one's blocks. *Equations* is a game involving constant decision-making. It was invented by Layman Allen, a professor of law at the University of Michigan. This game is open-ended and changes rapidly as each player takes his turn. The level of difficulty is determined by the number of cubes used, the color of the cubes, and the skill of the players. Seven-year olds can play the game with the twelve red blocks. Twelve-year olds and older children can play a more difficult game with five blocks of each color. It is advisable to begin with the simplest possible version of the game as described in the book of instructions and gradually add the more sophisticated rules. This game can be challenging to students from Grade II level to adult level.

In every elementary mathematics classroom, practice of basic facts is essential. Two commercially made games, *Numo* and *Operations Bingo*, allow for practice which is fun. *Numo* contains twenty-four different games which give practice in the facts of addition, subtraction, multiplication, division. Two games are based on equivalent fractions and two games are based on factoring.

The new feature in *Operations Bingo* is the bingo sheet. It is made of eleven columns and fourteen rows of squares. Before a game begins, the players decide whether they wish to play on a 3 x 3 square, a 4 x 4 square, or a 5 x 5 square. Each player chooses his own square of the specified size within the master sheet. A number or fact may appear on a card more than once. The rules of each game are decided ahead of time. They may be any one or a combination of: any four squares in a row; any three squares in a row; the four corners; all the numbers; or center free.

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Science Research Associates have produced sets of *Cross Number Puzzles* to give practice in all arithmetic operations with whole numbers, fractions, decimals, and also percent. The most recent box of cross-number puzzle cards provides practice with story problems. Humor and everyday situations add to the interest of the problems.

*Operational Systems Games* are challenging for junior high school students. Least common multiple, greatest common denominator, sets, clock arithmetic and modular arithmetic are the mathematical ideas on which the games are based.

One of the most popular mathematical games is *Numble*. This is a game which involves practice in addition, subtraction, multiplication, division, sequencing of numbers and in finding multiples of three. It is a game of strategy, for the playing board contains double and triple number squares as well as double sequence and triple sequence squares. *Numble* is a mathematical game which is analogous to the word game *Scrabble*. It can be enjoyed by all age levels.

A set of teacher references entitled *Let's Play Games in Mathematics* is available in seven volumes. The games are cross-referenced with content topics and with student behavioral objectives. This series and another single volume entitled *Math Games for Greater Achievement* would be useful references for elementary and junior high school teachers.

If an adequate supply of mathematical games is available in the Materials Center, teachers can use games as a valuable strategy to reinforce other methods of learning mathematical concepts. A corner of the Materials Center could be set aside for the playing of math games, and students could be encouraged to drop in for a game at recess or at noon. Layman Allen found that when children in Detroit schools became interested in the game of *Equations*, the rate of truancy dropped. Let's give students a chance to have fun with a purpose.

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