LEARNING WITH SECRET CODE 13+4

ABOUT THE GAME

# of Players: 1-4   **Grade**: 3rd-5th grade
Time:20 min   **Subject**: Math
Publisher: Haba   **Designer:** Jurgen P. Grunau

You have been chosen for a special mission! Well you and a few of your closest…. Rivals. The night you have been planning and preparing for has come. The precious Mask of Amun Re has arrived and is now on display at the Museum. You pack your trusty dice, run through some precise calculations, and off you go to break into the museum. You know you'll have to think quick and combine numbers (add, subtract, multiply, and divide) to deactivate the light barriers and obtain the Mask of Amun Re! Will you be named The Best Arithmetic Agent? Will all your planning and preparation pay off?

The game is built around the idea of reaching target numbers given a pool of starting numbers (dice), which are then manipulated by any desired mathematical operation(s). The goal is to use addition, subtraction, multiplication, and division efficiently with each roll of the dice to maneuver through the light beams preventing the agents (players) from moving forward. In fact, using the numbers rolled efficiently will allow you to work past multiple beams in a round and may give you the tools to hold the precious Amun Re Mask (WIN the game)!

WHAT THE GAME TEACHES

Secret Code 13+4 is a Math game. It reinforces mathematical equations using addition, subtraction, multiplication, and division. When you think about the mathematical factors involved in traversing the light beams, you will realize the game is more than basic math. Numbers 1-9 can be obtained using a single die. However, numbers 10 -20 will require multiple dice (factors) and will sometimes require more than just addition to meet their targets. For example, 12 can easily be obtained (6+6, 9+3, 8+4, 7+5, 2x6, 3x4), 18 is a bit harder (9+9, 9x2, 6x3), and numbers like 7, 11, 13, 17 will require some form of addition, and/or subtraction as it is a prime number and only has 1 as possible multiplication factor. The higher numbers will require not only addition and/or subtraction but will need multiplication and/or division to meet their targets. This is a great way to show how different target numbers have different mathematical equations and factors. In later games you can even encourage students to think strategically using probability in their decision making. Each roll of the dice will present new mathematical challenges and can provide great insight as to the student's mathematical ability.

EXAMPLE LESSON PLAN	Prep Time: 5 min
	Material Usage: Paper, pencils and Secret Code 13+4

Standards and Learning Outcomes: 3rd-5th grade Solving problems involving four operations, and identify and explain problems in arithmetic, using four operations to solve problems with whole numbers

Instruction: Shuffle the number tiles and distribute them on the squares with the light barriers. It does not matter which side is facing up. Each player picks an agent and places them at the starting position, the front of the museum. Roll the six dice and determine how to break the code on the door (the number on the tile). If one of their numbers rolled is that number, they may use this die for that code. Once a die is used, it may not be used again on the same turn. If none of their dice are that number, then they must use any of the four operations and multiple dice to get to that target number. Any dice used must not be used later in that turn. The player goes through as many of the light barriers as possible on their turn before they either run out of dice or cannot progress any further due to not being able to crack the code with the dice they have.

After the Game: Ask the students if they caught any mistakes they or their opponents made. Who had the most amount of codes cracked on a single roll? Who had the least? After the first game is finished and the students completely understand the rules, tell them to play again if there is time, and to try and maximize the amount of codes they crack on a single turn.

For Longer/Harder Games: For longer and or harder games tell students they can only use two functions the entire game. This will force them to either have a luckier roll and/or be more efficient with the numbers they have been given. You may also have them go all the way back to the beginning after the mask was taken and if the leader is passed in this game, on the way back, the new leader takes the mask from them and becomes the winner if they make it out before everyone else.

Assessment: Assessment can vary depending on the amount of dice used and on the learning outcomes that you are trying to obtain. You may have students write down the numbers rolled and show their work on each code they crack. Having them write the numbers down may even allow them to see more options before committing to a specific one.

The other way that this game shines is in alignment to the new expression of mathematical thinking found in the Common Core Standards for Math. The first standard in the Math Practice domain involves students making sense of problems and presistence in finding a solution. As the standards explain, students will need to engage in certain practices to be successful. Taken from Common Core Math:

"They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary."

All this is doable in Secret Code 13+4!

Please contact us if you have any questions about this game, or if you would like to know about more games that can help make learning fun! Visit us at fireflytoysandgames.com.