



MIXED OPERATIONS – LEVEL 2: STAKE YOUR CLAIM

Materials:

Number line from 0 to 99

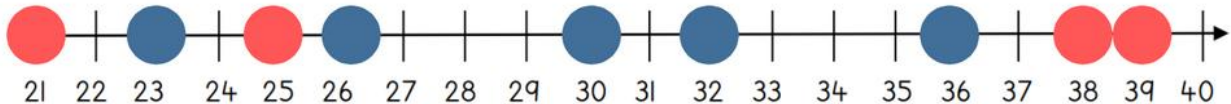
Deck of playing cards, with the 10, jack and king removed. The queen serves as 0, the ace as 1

20 Counters in two colors

Instructions:

This is a two player game. Each player gets their own set of color counters. Put all cards in a draw pile.

On a turn, a player selects two random cards from 0 to 9. The player gets to choose the order of these two digits, to generate a number from 00 to 99, and then puts a counter of their color on the number line. For example, if a player draws a 7 and 2 from the draw pile, they can either choose to put their counter on 27 or 72. The first player to get four numbers that do not have any of the opponent's numbers in between wins.



Here is a possible outcome of a game (showing only a partial number line). In this case blue wins.



MIXED OPERATIONS – LEVEL 3: TAX COLLECTOR

Materials:

Number grid to 24

Counters in 2 colors

Pencil and paper (to add up numbers, if needed)

Factors:

Before starting this game, make sure your child understands what a **factor** is. Here are two examples.

The **factors** of 6 are 1, 2, 3, and 6. They are factors of 6 because they can be multiplied together to get 6

$$1 \times 6 = 6 \qquad 2 \times 3 = 6$$

Similarly, the **factors** of 12 are 1, 2, 3, 4, 6, and 12 because

$$1 \times 12 = 12 \qquad 2 \times 6 = 12 \qquad 3 \times 4 = 12$$

Instructions:

In this two-player game, the players alternate between being the tax collector and the taxpayer.

On a turn, the taxpayer chooses a number (their paycheck), which is a number on the grid that is uncovered and has at least one factor uncovered. The taxpayer puts a counter on the selected number and the tax collector puts counters on all of the available factors (taxes to be paid). That ends the turn and the roles of taxpayer and tax collector are reversed.

Play continues until a player no longer has a legal move. The players then add up their numbers, and the player with the higher sum wins.

Variations:

This can be played as a one-player game. The one player has the role of the taxpayer. After the taxpayer makes the last legal move, the remaining numbers all go to the tax collector. The goal of the taxpayer is to make as large a score as possible, preferably larger than the tax collector's score.

You can adjust the grid size to suit the ability of the players - it could be 1 to 12 or as high as 1 to 60.



MIXED OPERATIONS – LEVEL 4: COUNTING NEIGHBORS

Materials:

Three dice

An 8 by 8 number grid with all numbers from 1 to 64

20 counters of any kind

Paper and pencil for scorekeeping

Instructions:

A player rolls the dice and uses addition, subtraction, multiplication, and division to claim any uncovered number on the board. The player covers this square with a counter and receives one point for the square plus one more point for each covered square that it touches (including diagonally).

If a player cannot make a play, any other player who finds a play can claim that score.

Decide in advance how many rounds you want to play. Probably at least five plays for each player.

After the rounds are over, add up all the points. The player with the largest score wins.

Variations:

Use four dice.

Use a larger or smaller grid (1 to 100, 1 to 81, 1 to 49, 1 to 36).



MIXED OPERATIONS - LEVEL 4: "PARENTHESES FIRST" PUZZLES

Materials:

Parentheses puzzle sheets

Pencils

Instructions:

The puzzle sheet has some messy math equations! All the parentheses have been erased. Have your child solve the puzzles by putting the parentheses back in! Make sure your child understands that what is inside a pair parentheses is always evaluated first.

For example: Where should parentheses be added to make this equation correct?

$$8 \times 4 - 2 = 16$$

- Without parentheses, $8 \times 4 - 2 = 30$
- With parentheses around 8×4 we get $(8 \times 4) - 2 = 32 - 2 = 30$
- With parenthesis around $4 - 2$ we get $8 \times (4 - 2) = 8 \times 2 = 16$

So the parentheses should go around $4 - 2$

Thoughts to take home:

It is easy to make your own parentheses puzzles and have your child solve them! Write out the puzzle with parentheses first and then give your child a version without the parentheses.

Also, have your child make puzzles for you!