

ΛΒΛΛΚΛ ΕΔΛ

Exercises examples

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## Find Operations

### Teacher

Prepare tiles on board so they create Abaku rows. In such way you may prepare even more independent rows in one exercise.



Play

### Student

Students try to find equations according to Abaku principles and select mathematical operations used in such equations. They are not able to move with the tiles.

### Example

Place row 1234 on board and students select addition + ( $1 + 2 = 3$ ) and division : ( $12 : 3 = 4$ ).

This exercise type is very similar to finding equations, so you may use the same number rows. Yet I would recommend limit the length of row to 6 numbers for younger and 8 numbers for older children.

At least two different mathematical operations should be used in all rows.

### Addition and subtraction

Up to number 20, for younger students, preferably first-grades.

**6 3 3 1 2 1 1**

**8 7 1 6 4 2 2**

**4 2 6 1 7 2 9**

**5 3 2 5 7 4 3**

**1 7 3 4 8 1 2**

**1 7 8 1 5 6 1 1**

**5 8 1 3 4 7 1 1**

**4 5 9 6 3 7 1 0**

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Rows with all math operations

**4 3 1 2 2 6****1 6 8 8 1 7****1 7 8 5 6 3 0****5 7 3 5 1 5 5****3 6 4 9 7 6 3****6 4 2 7 6 6 3**

## Find Equation

### Teacher

Prepare tiles on board so they create Abaku rows. In such way you may prepare even more independent rows in one exercise.



### Student

Students try to find equations according to Abaku principles and select tiles forming the equation one by one. They are not able to move with the tiles.

### Example

Place row 1234 on board and students select numbers 1, 2, 3 (equation  $1 + 2 = 3$ ) and add it. Then select 1, 2, 3, 4 (equation  $12 : 3 = 4$ ), and add it.

### Addition and subtraction of one-digit numbers

Set of rows for first-graders. First rows are only about adding and subtracting. Students learn to solve the rows like adding beads on the string. When creating own rows be aware not to intersect them in just the one outer number as the first row below is. Students will learn to select related triplets without any counting very fast.

**1 1 2 1 3 1 4 1 5 1 6**

**9 1 8 1 7 6 1 5 1 4 3 1**

**2 1 3 4 2 6 1 7 2 9**

**9 1 8 2 6 3 3 1 2 1 1**

**2 6 8 7 1 6 4 2 2 7 9**

**8 5 3 2 5 7 4 3 6 9**

### Adding and subtracting up to twenty

We are still in first grade. Now we work with two-digits numbers which students perceive both as one two-digits number and two separate numbers. Keep in mind the special treatment of number zero (see last row, it is not  $22 + 0 = 22$ , but  $2 + 20 = 22$  - since zero doesn't like to be alone and must be always attached to some other number).

**1 7 8 1 5 6 1 1 2 7 9 1 6**

**3 5 8 1 3 4 7 1 1 3 1 4 5**

**9 5 1 4 5 1 9 6 3 7 1 0**

**2 0 1 7 3 4 8 1 2 2 0 2 2**

### Adding and subtracting one and two-digits numbers

Best for practicing memory counting abilities. Rows are best suitable for second grades, but also for older students for practice.

**8 7 1 5 2 2 3 7 1 0 4 7 1 1**

**4 1 5 8 9 9 8 0 2 3 5 7 1 2**

**3 1 4 3 7 4 3 6 3 8 7 1 7 8**

**7 2 5 3 1 9 2 2 3 1 4 3 7 4**

### Multiplication and division

These are fairly easy to create. Just remember not to prefer one equation or one type of equation and do not omitted some connection of numbers.

**3 4 1 2 6 2 8 1 6 4 4 5 2 0**

**7 8 5 6 3 0 1 0 3 7 2 1 4 4**

**5 7 3 5 1 5 5 2 5 1 0 5 0**

**3 6 4 9 7 6 3 1 8 2 9 3 2 7**

**4 2 7 6 6 3 6 4 9 5 4 5 2 0**

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Rows using all math operations

**3 6 9 4 6 5 3 0 9 5 4 5 5 0**

**7 3 2 1 9 4 1 3 5 2 1 0 4 2**

**3 8 2 4 3 2 4 8 8 0 5 1 6 6**

**3 5 8 4 0 4 8 6 8 9 4 3 6**

**4 7 2 8 1 6 4 4 1 2 3 3 6**

**8 9 7 2 1 7 3 9 4 3 5 7 5**

**3 6 1 8 2 1 6 9 8 7 2 1 4**

## Fill in the Blanks

### Teacher

Prepare tiles on board so they create Abaku rows. Leave some squares before, in the middle, or at the end empty and tap them to indicate that these should be filled in.



### Student

Students fill in the blank squares with tiles to create as many equations as possible. They are not able to move with the tiles.

### Example

Place row 12\_4 on board and allow students to use numbers 3, 8 and 0. Students put number 3 in the blank and thus creates equation 1234. Or the they may fill it in with 1284. Number 0 is of no use here and doesn't create any equation.

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**1 2 \_ 4 ... and allow to use 8, 3, 5**

**\_ 8 1 6 ... and allow to use 0, 2, 8**

**7 \_ 1 4 ... and allow to use 7, 3, 2**

## Rearrange Tiles

### Teacher

Prepare tiles on board. They need not to be Abaku rows. In such way you may prepare even more independent rows in one exercise.



### Student

Students rearrange tiles to create an equation (by using Abaku principles) with as many subequations as possible.

### Example

Place 4213 row on board and students may rearrange it to 1234, which contains two equations ( $1 + 2 = 3$ ,  $12 : 3 = 4$ ) or 4312, which contains three equations ( $4 - 3 = 1$ ,  $3 - 1 = 2$ ,  $4 \times 3 = 12$ ).

### Multiplication (or division)

Following exercises are good for teaching how to multiply (or divide) as well as for rearranging purposes.

**1226**

**1268**

**1289**

**1234**

**1355**

**1237**

**1446**

**2348**

**2379**

**2446**



**2478**

**3469**

**4559**

**2467**

**4688**

**4569**

**3679**

**3789**

**1899**

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**Addition (or subtraction)**

Following exercises are good for teaching how to add (or subtract) as well as for rearranging purposes.

**1912**

**1934**

**4195**

**6197**

**1978**

**2184**

**5138**

**7158**

**8168**

**5127**

**6137**

**7417**

**6115**

**6126**

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#### Roots and cubes

**4337**

**1255**

**2979**

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#### Multi-digit rows

Previous rows serves as a base for the following multi-digit rows. Feel free to use the pattern with other rows from above.

**12368**

**24688**

## Replace Tiles

### Učitel

Prepare tiles on board. They need not to be Abaku rows. Also prepare tiles that students might use to replacing. In such way you may prepare even more independent rows in one exercise.



### Student

Students replaces tiles lying on board with the one from their stacks to create an equation (by using Abaku principles) with as many subequations as possible. Tiles can be replaced only one for one and tiles lying on the board cannot be moved.

### Example

Place row 1274 on board and allow numbers 3 and 0 to be used. Students replace number 7 with number 3 and create an equation 1234 containing two equations. Number 0 is of no use here since it doesn't create any equation.

**9 3 1 0 ... and 1 2 5 for replacing**

**9 5 1 2 ... and 3 4 5 7 for replacing**

**8 3 1 2 ... and 1 2 4 9 for replacing**

**1 3 4 5 ... and 8 9 2 for replacing**

**1 4 7 6 ... and 1 2 7 8 for replacing**

**2 8 1 8 ... and 0 5 6 9 for replacing**

**9 5 1 5 ... and 2 5 4 6 for replacing**

## Having any idea?

If you have crafted some nice exercises and want to show them to the world, feel free to send them to us. We are more than happy to enrich our collection.

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