

Dr Jef van Kuyk



Instructions



MATH BOX 2 AND 3

494.001 and 494.002



Objective:

The goal of Math box 2 and 3 is to teach children aged 0-5 how to play and experiment with sequences in chunks of 5 based on clear and recognizable size characteristics, such as bigness, thickness, length, height, and width.

Contents Math box 2 and 3:

Math box 2 and 3 consists of two boxes, namely Math box 2 with circular shapes and Math box 3 rectangular shapes.

Math box 2:

- ▶ Three wooden boards with slots that fit round, three-dimensional objects.
- ▶ 15 Three-dimensional objects:
 - five spheres from large to small.
 - five disks from large to small.
 - five cylinders from thick to thin.
- ▶ Three plastic example plates. One side features filled-in plane shapes of round objects. The other side features plane shapes as well, but now they are drawn with a line only.

Math box 3:

- ▶ Three wooden boards with slots that fit rectangular, three-dimensional objects.
- ▶ 15 Three-dimensional objects:
 - five rods from long to short.
 - five blocks from high to low.
 - five boards from wide to narrow.
- ▶ Three plastic example plates. One side features filled-in plane shapes of rectangular objects. The other side features plane shapes as well, but now they are drawn with a line only.

Methods:

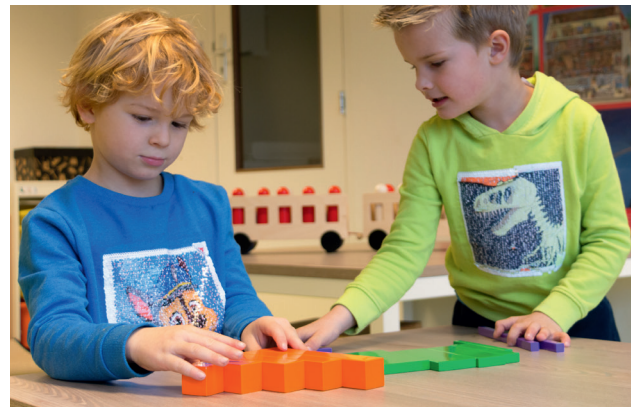
The goal of Math box 2 and 3 is clear, yet it can be reached in many different ways. Math box 2 and 3 can be used as playing materials, developmental materials, and learning materials. In fact, there is no fixed order. There is a balance between the extent to which children can make their own choices and the support from the teacher. Make sure that the children always respect the materials. The materials should remain appealing and last a long time.



Playing materials

With these materials, the child can experiment freely and play in his or her own way. The idea behind Math box 2 and 3 is similar to making 'sand cakes', an activity in the sandpit that children enjoy. The baker puts the sand in a cake mold and then puts them in the 'oven'.

The children can also learn to play and experiment with the objects. For example, they can try to roll the spheres, disks, and cylinders. These objects will look different when rolled. Children can also stack the objects, such as the disks and the cylinders. Can the children also put the spheres on top of the cylinders? They can try to build a tower with the blocks, for example, and decide whether to use the boards or not.



Support the children by playing together with them, showing them how to play, or by setting a good example. The teacher can also introduce his or her own creative ideas in the game.

Developmental materials

The children can take the materials out of the cupboard and start playing by themselves. Try to limit your advice to a minimum.

Support the child when necessary or when he or she asks for it. You can point out the boards and the slots, which are ordered from large to small. You can also repeat the various concepts, such as larger, smaller, largest, smaller, or, more specifically, long-short, thick-thin, high-low, and wide-narrow. Ask the children to articulate the concepts while playing.

- ▶ Use a rug or mat to prevent damage to the materials. Start by placing one board on the rug or mat and then ask the child to place the objects in the correct slots. Later on, you can use multiple boards at the same time. The children will find the correct solution by playing and experimenting. They can also use the boards to see whether their solutions are correct. When a board has been filled with objects, then the child can lift it. The result is a sequence of objects. This is a surprising result and children enjoy it, similar to making sand cakes. Often, children will place the objects back automatically, which allows them to practice again with the sequence (Funktionslust).
- ▶ Children can also place the board back on the objects. Children feel a natural curiosity to find out whether the board 'fits'. This requires precision and motor control, and is an important exercise for motor skills.
- ▶ Place all boards in the stand or put them on the table. Now ask the children to find out in what boards the objects can be put.
- ▶ If you place an example plate in the presentation tray or on a mat or rug, then you can combine the three-dimensional objects and the corresponding plate. Start with the filled-in shapes, and later use the shapes that are drawn with a line only. This shift represents an increase in difficulty.
- ▶ The presentation tray (included with the example plates) can also fit a sheet of paper. When you place one of the assignment sheets on it, the children can use a pencil to trace the slots. As a result, children can create their own assignment cards and colour them in. Alternatively, you can make a copy with a photocopier or take a photo with a smartphone.





I Group's activity

The teacher places one or more boards in the circle. The objects are divided amongst the children. In turns, the children may place one of their objects in the correct board. When all objects have been placed, a child or the teacher can lift the boards. The objects now make up sequences. Discuss this with the group to stimulate their language development.

Concepts

- ▶ Practise simple concepts with the children: 'What is the largest, and which is smallest? Which one is bigger, and what object is smaller?' The children do not yet have to know the concepts thick-thin, long-short, high-low, and wide-narrow, but the teacher makes sure to mention them often. You can also give assignments, such as: 'Can you take the biggest (or thickest, shortest) object?'

Combining with Math box 6

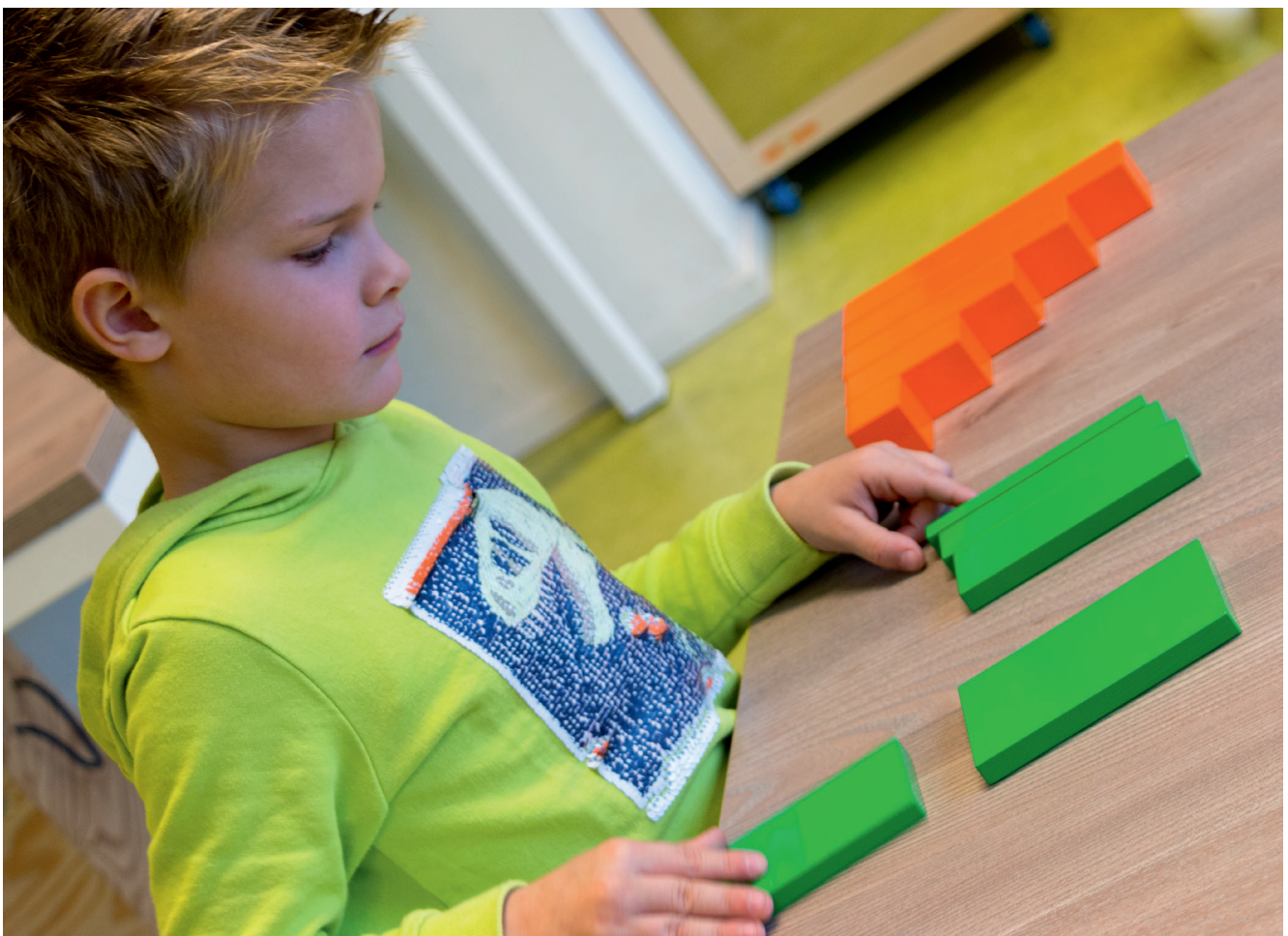
- ▶ Place the objects on the corresponding board. Ask the child to count the number of objects. Now search for the card with the correct number of dots from Math box 6. When the child is familiar with all numbers, then you can add the card with '5' on it. Many variations are possible. The children can also work together.
- ▶ Ask one child to place a number of objects in the sheet. The other child adds the corresponding dotted card or a card with a number on it. You can come up with many variations.

Drawing together

- ▶ Show the child how to trace the shapes on a sheet of paper. Can the child find the corresponding objects?

Counting

- ▶ While playing, the child can count the objects: 'How many spheres do you have left? How many slots do you see? Do you have enough spheres?' Children can try to count up to and including five.



Learning materials

The teacher teaches the child directly about the characteristics of the materials and how it is organized. The latter is especially important for children who find it difficult to work independently and take initiative.

- ▶ Place the materials in front of the child. Use the correct terms, although the child does not have to know these him or herself: 'This is a board with holes in it. Here, I have 5 yellow disks. These disks fit in the holes. Now, I start as follows: I put the largest disk in the largest opening. Then, I take a disk that is a little bit smaller... and this is the smallest disk. See?' Ask the child to copy your actions. 'Take the disks from the board. Can you now place them back? Try to find the correct holes.' Articulate what the child does: 'Let's check together. Are they all... Do all the shapes have the same colour?'
- ▶ Play the same game with the other circular shapes.
- ▶ Now, play the same game with the rectangular shapes.
- ▶ Give the child a board and ask him or her to put the spheres in it. Which is the largest? Where could it go? Do the same for all the boards. 'Which board do I need for these objects? Choose one. Do the objects fit?' Now work with the example cards. These offer repetition, variation, and abstraction.
- ▶ When children are unmotivated, then show them how to do the exercises, ask the children to copy your actions, and verbalize what you do. Can the child now play the game him or herself? If the child is not interested, then move on to the next activity.



