

Dr Jef van Kuyk



Instructions



MATH BOX 1

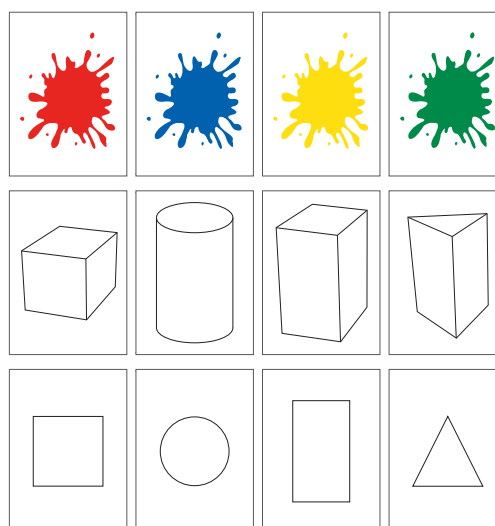


## Objective:

The objective of Math box 1 is to teach children aged 0-5 to classify objects in a playful and experimental manner. This includes grouping objects on the basis of specific, recognisable characteristics, such as colour, shape, and being two- or three-dimensional. The objects are two- or three-dimensional.

## Contents Math box 1:

- ▶ Math box 1 consists of a box. The box contains four smaller boxes. The smaller boxes can be taken out of the larger box and divided among the children, so that every child has his or her own box. Each of the 4 smaller boxes contains a lid with a different colour: red, blue, yellow, and green. These lids also serve as game boards. The opposite side of each game board is coloured white.
- ▶ 16 large, three-dimensional shapes (cube, cylinders, four-sided prism, and three-sided prisms) in 4 colours: red, blue, yellow, and green.
- ▶ Assignments cards:
  - 4 Cards: red, blue, yellow and green, no particular shape.
  - 4 Cards: cube, cylinder, four-sided prism and three-sided prism, no colour
  - 4 Cards: circle, square, rectangle and triangle.



## Methods:

The goal of Math box 1 is clear, yet it can be reached in many different ways. Math box 1 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

The children can experiment freely and play (together). The boxes can be used to play games with the blocks. In fact, children can use the boxes to build. Moreover, they can sort the differently shaped blocks with help of the openings in the lids (game boards) on the boxes.

Very young children can already play and experiment with Math box 1, a sort of 'Functionslust'. They can feel, examine, and use the blocks. In fact, these children like to put the blocks in the openings, whether large (i.e., the whole box) or small (i.e., openings in the lid). As it can be too challenging for the children to start with all two- and three-dimensional materials, we advise you to make a selection.

**Support** the children by playing together with them, showing them how to play, or by setting a good example. Articulate what the child has done. See also 'Playing and working together'.

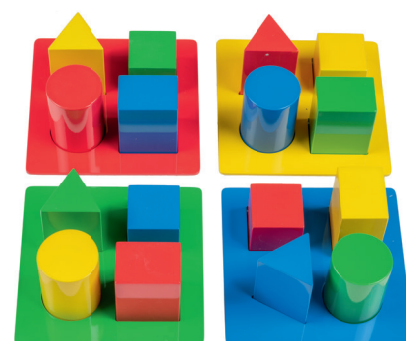


## Developmental materials

The children pay attention to the characteristics of the materials and how it is organized. They classify on the basis of colour, shape, or being two- and three-dimensional. The boxes and lids allow the children to check their own answers. Let the children work independently. In fact, try to limit your advice to a minimum.

**Support** the child when necessary or when he or she asks for it. For example, you can point out the characteristics of objects, show which shapes can fit in what openings, and what the differences and similarities are.

- ▶ When playing for the first time, take the two-dimensional shapes from the box. This prevents the child from being over-challenged with too many shapes. You can start with a single box. The box contains the three-dimensional shapes and the child attempts to order the shapes (e.g., red) by putting them in the openings in the red lid on the box. Afterwards, you can check the child's answer by taking the shapes out of the box and sorting them by colour. You can do this in the red lid, as it provides a clear overview. This allows you to easily see whether the 4 shapes have the same colour. Do the same for the other boxes.
- ▶ Stacking: put the same shapes (of different colours) on each other. This is an excellent exercise to train motor skills. Are the shapes stacked neatly?
- ▶ Once the children are familiar with the three-dimensional shapes, you can add the two-dimensional ones. Use the lids (i.e., game boards) of the boxes to sort the two-dimensional shapes. Turn over the game boards, which reveals their white side, to make this activity more difficult. You can also sort only based on the type of shape when the white side of the lids is facing upwards.
- ▶ Children can also experiment and 'play' with the different colours of the lids (see photo). For example, you can place yellow two- or three-dimensional shapes in the red lid. Or you can place four different shapes in the yellow lid. As such, almost endless variation is possible. The children can give each other assignments and carry them out. How are the lids and blocks arranged?





## I Possibilities

Example of the many possibilities.

- ▶ You can combine the two-dimensional shapes with the three-dimensional shapes by placing them on top of each other.
- ▶ You can also sort the two-dimensional shapes on the basis of colour. Then, you place the three-dimensional shapes on top of them. See also the idea above.
- ▶ **Game:** the white sides of the game boards face upwards. Alone or in pairs, the children try to place the two-dimensional shapes in the game boards. Not only can they try to sort the shapes by colour, but they can also try to put one shape of each colour in a game board. The same goes for the game boards with the different colours.
- ▶ **Playing and working together**  
Children can do an activity in pairs or groups of 4. In turns, they check whether the other has, or the others have, completed the activity correctly.
- ▶ **Skill games and contests**  
When the children use all 4 boxes, then they can see who can put the objects in the boxes fastest. Afterwards, they can check together whether they did so correctly. The children can play the same game with the two-dimensional shapes or a combination of both kinds of shapes.

**Memory:** place all of the two-dimensional shapes on a table or mat. Make sure their white sides face upwards. In turns, the children may turn over 2 shapes with a shared characteristic. If these shapes are of the same colour, then the child may keep them. The turn then goes to the other child. Who can gather the most shapes?

**Lotto:** every child takes two game boards. All of the shapes are placed in between the children, namely the three-dimensional shapes, two-dimensional shapes, or a combination of both. In turns, the children may take a shape and place it in an opening in their game board. When a child takes a wrong shape, then he or she must place it back and the turn goes to the other child. The game ends when a child has completed his or her 2 game boards, although the children can also continue playing until all shapes have been used.

- ▶ **Assignment cards**  
With help of the assignment cards, the children can give each other assignments. For example, child 1 takes the red card and a cylinder. The other child must then place all the red cylinders in the box. The game can also be played differently: child 1 carries out an action and the other child must find the corresponding assignment card. For example, child 1 places all blue, three-sided prisms in the box. Can the other child find the corresponding assignment card?
- ▶ **Challenging assignments**  
Some kids might require an extra challenge. Try to come up with assignments that will challenge their minds. For example, they could place 2 two-dimensional shapes in a row. Can they extend this row with shapes that differ in one characteristic? What do you have to pay attention to?

## Learning materials

The teacher takes on a more leading role and teaches the child directly about the characteristics of the material and how it is organized. The latter is especially important for children who find it difficult to work independently and take initiative.

**Support:** Show how an activity can be done, possibly even do it together with one of the children, and articulate what the child does and what you do yourself. For example, say the following: 'Let's have a look. Are the objects ordered neatly?' Of course, this is just one of the many things that can be said. Make sure to repeat and vary what you say.

- ▶ 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 box with a lid. It can fit 4 shapes. Look, these. We take the shapes with a similar colour, namely red. This is a cylinder, and it fits in this red hole. Have a look! This is a three-sided prism, which fits in this triangle. Did you see?' Articulate clearly what you do: 'I will put these 4 shapes in the openings. I will start with the cylinder.'
- ▶ Ask the child to copy your actions: 'Take the shapes from the box. Can you place them back? Look for the correct openings.' Articulate what the child does: 'Let's see what you did. Do these shapes have the same colour?' Repeat the assignments and ensure variation.



