

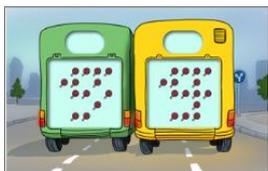
Coach's guide part 2

Number Quest



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NUMBER SENSE – SMALLEST/LARGEST NUMBER



EXPLANATION

The exercises in this area train the child's sense of number. A number of items are presented in two separate boxes. From levels 1 to 27 the child's task is to determine which box has the largest number of objects. From levels 28 to 30 the task varies between deciding where the smallest/largest numbers of objects are shown. The exercises at the more advanced levels of training also requires that the child to first solve an addition or subtraction problem and then evaluate on which side the number is greater or smaller. Answers are always given by clicking on one of the two boxes.

GUIDANCE

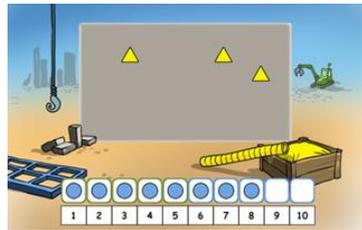
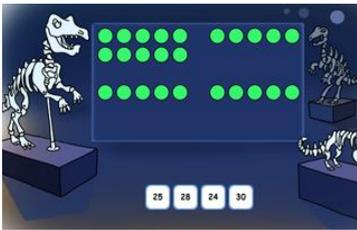
At levels 28-30 make the child aware that it can be where either the smallest or largest numbers of objects are shown that should be determined. Also make the child aware that it is the sum or difference that is of importance in the exercises which include addition and subtraction.

FURTHER WORK

If the child has difficulties with number sense at the initial levels of the task, you may want to train to the child's understanding using concrete objects and exercises like Kim's game with a few

objects. Practising with different concrete number symbols such as dice or hands is also good to support number sense. For older children, you may want to practise strategies for grouping numbers. This will help them better manage the tasks with addition and subtraction.

NUMBER SENSE – GEOMETRIC FIGURES



EXPLANATION

The exercises in this area train the child's number sense. The exercises also train the geometric concepts circle, triangle and square. A number of geometric figures appear on the screen. The pupil's task is to indicate how many geometrical figures are shown by clicking on the correct number at the bottom of the screen. At more advanced levels distractors (other geometric figures than the target object) are also shown on the screen. At more advanced levels the exercise also trains the child to ignore distractors and be able to choose the correct geometric figure and perceive the correct number of that figure.

GUIDANCE

Make sure the child knows the correct names of the geometric figures.

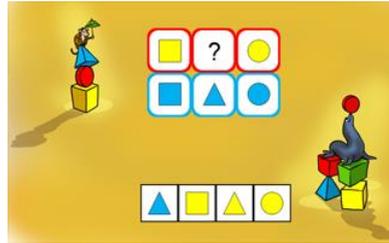
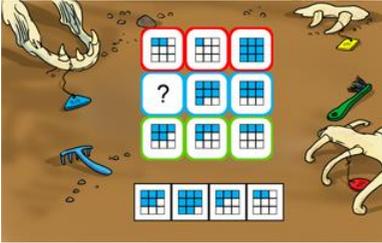
FURTHER WORK

Repeat exercises where the child directly and indirectly makes use of the geometrical concepts. Work with an understanding of the similarities and differences between the various forms. Make the child aware that a square is a special sort of rectangle.

SUGGESTED WORKING MATERIAL

Use a sheet of paper with different sizes of the geometric shapes that are in the program that the child can cut out and compare. Then the child can also train their understanding of magnitude and similarities and differences between the various geometric figures.

PATTERN RECOGNITION - GEOMETRIC FIGURES



EXPLANATION

These exercises train understanding of the patterns that are a basis for understanding areas of mathematics which use patterns, such as algebra. A number of items are displayed in a grid of either 2x3 squares or 3x3 squares. In one of the boxes a question mark replaces the item. The child's task is to select which of the four items that appears at the bottom of the screen best completes the pattern shown in the grid. The complexity of the patterns gradually increases for each level.

GUIDANCE

Start by making the child aware of the structures in the patterns he/she first encounters. Please explain clearly what is meant by "patterns".

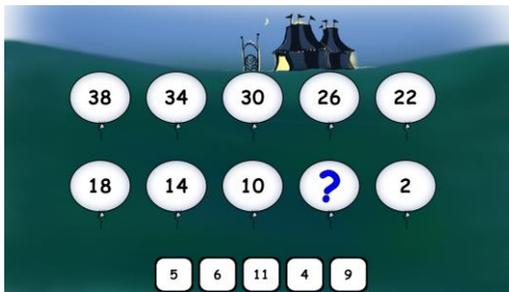
FURTHER WORK

If the child has difficulties perceiving patterns, let them create their own patterns with concrete materials. Then allow them to draw patterns. Children can create patterns for each other and develop them further.

SUGGESTED WORKING MATERIAL

Paper with a pattern of physical objects.

NUMBER PATTERNS



EXPLANATION

These exercises train the understanding of number patterns which are used in many parts of mathematics, such as algebra. A series of numbers is displayed either on a line with five numbers, or in two rows of five numbers. One of the numbers is replaced by a question mark. The pupil's task is to click on the number at the bottom of the screen that best completes the number pattern. The complexity of the number patterns gradually increases for each level.

GUIDANCE

Explain how the patterns work for the child in the initial trials; help them to identify the structure. Please refer back to "Pattern recognition - geometric figures".

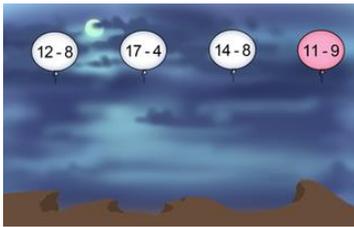
FURTHER WORK

Have the children create their own patterns of numbers. If students have difficulty, go back to the pattern of physical objects (see “Pattern recognition - geometric figures”). Start with a “leap of two” to help the child to see the structures.

SUGGESTED WORKING MATERIAL

Different series of number patterns.

NUMBER SENSE - BALLOONS



EXPLANATION

A number of balloons rise up to the top of the screen and then slowly drop towards the bottom of the screen. Initially the balloons contain characters corresponding to the numbers 1-5, then the numbers 1-9, and finally addition and subtraction tasks. The pupil’s task is to click on the balloons in ascending order from smallest number/sum/difference to the greatest number/sum/difference.

The exercises train the child to sort and classify numbers. The exercises with addition and subtraction also train the child to first perform a calculation and improve the ability to automatize fundamental calculation skills.

GUIDANCE

Please refer to the number line when the child starts the task, so that she/he understands that they should click on the balloons in ascending order. Make the child aware that it is the sum or difference which is important for the exercises that include addition and subtraction. The child will first complete a computation and then arrange the sum or difference in ascending order.

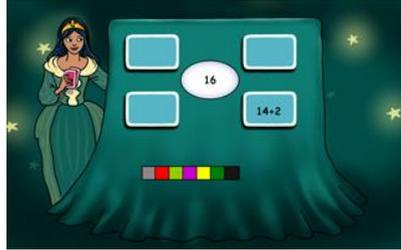
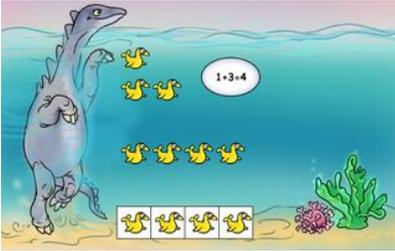
FURTHER WORK

If the child has difficulties with the basic understanding of the task you can use the number line. Let the child have a number of physical objects and then let him/her to group them and put them in ascending/descending order on a number line. If the child has difficulties on the levels where addition/subtraction is added have the child to first perform an addition/subtraction and then evaluate the responses on a number line.

SUGGESTED WORKING MATERIAL

Number lines with 0-5, 0-10, 10-20 on which the child can put objects/numbers.

NUMBER BONDS



EXPLANATION

These exercises train number bonds. An addition task is presented in a box at the top of the screen. The child's task is to specify the number that, together with the first term adds up to the sum presented. On the first level the tasks use number bonds to 5. The child answers by clicking on the row with the number of items that correspond to the correct term. On more advanced levels, number bonds to 10 are to be identified by selecting the rod to be added to the rod that is shown at the bottom of the screen to form the sum presented. At the most advanced levels, four pairs of terms using number bonds to 20 are presented. In the centre is a fifth area where a number (the sum) is shown. The child's task is to specify the pair of terms that form the sum presented in the middle.

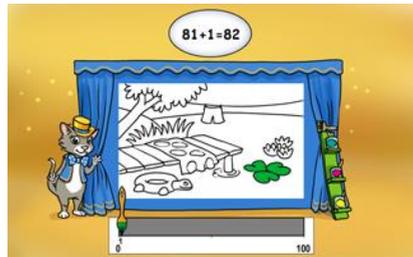
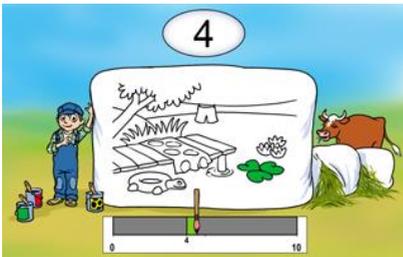
GUIDANCE

Explain the relationship between the images and the addition task.

FURTHER WORK

Work with different ways to write additions. For example, $8 = 2 + _$, $_ + 2 = 8$. This can be trained in parallel with specific material to see the connections and the commutative law (e.g. it does not matter in which order the computation is done).

THE NUMBER LINE – PAINT



EXPLANATION

A number appears at the top of the screen. The child's task is to click where they think the number appears on the number line. Number lines 5,10,20,50 and 100 are represented. At more advanced levels, an addition or subtraction task is presented at the top of the screen. The exercises in this area train the child's understanding of the number line. This is an important basis for understanding mathematics. The pictures being painted are there to boost motivation.

GUIDANCE

Show the child the connection between speech and the number line. Note that there are different types of number lines shown on the different levels. Make the child aware that it is the sum or difference which is important in the exercises that have addition and subtraction. They should therefore first complete a computation and then plot the sum / difference on the number line.

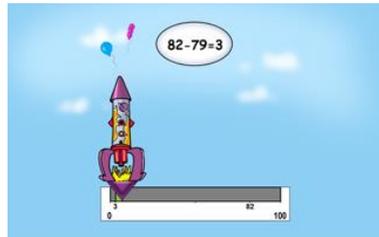
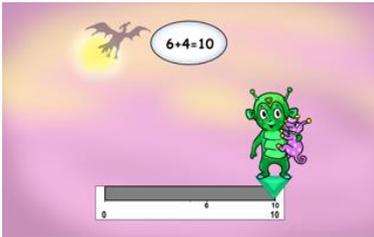
FURTHER WORK

Make the child aware of how a number line is constructed and that it can be designed in different ways. Practise drawing and discussing different types of number lines. If it is difficult, go back to using concrete representations and place them on the number line.

SUGGESTED WORKING MATERIAL

Number lines with 0-5, 0-10, 10-20 on which the child can put objects/numbers (same as on “Number sense – balloons”).

THE NUMBER LINE - VEHICLES



EXPLANATION

These exercises also train the mental number line. An addition or subtraction task appears at the top of the screen. A marker is shown at the location on the number line corresponding to the first term. The pupil's task is to indicate the position of the sum or difference on the number line. Number lines 5,10,20,50 and 100 are represented.

GUIDANCE

Make the child aware that it is the sum or difference which is important in the exercises. The child will first perform a mental computation and then plot the sum / difference on the number line.

FURTHER WORK

Practise plotting numbers on a number line. Try using different number lines, preferably with higher numbers.



This material was created by clinical psychologists Erik Truedsson and Stefan Strohmayer with cooperation from Helena Roos, researchers and teachers at the Linné University, Sweden who specialize in special educational needs and mathematics.

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