



# ADDITION AND SUBTRACTION

## number range 0-10



## ADDITION AND SUBTRACTION, number range 0–10

Addition and subtraction 0–10 contains 15 teaching sessions for practising addition and subtraction. Addition is practised in the first eight sessions. The sessions emphasise the concept of addition and the commutative principle, and fluency practice using calculation strategies. The following five sessions focus on practising subtraction. In the sessions, understanding the concept of subtraction is practised as taking-away and the difference between numbers, and fluency is practised using calculation strategies. Finally, subtraction and addition with missing parts in a number sentence is practised.

The teaching sessions are designed to be held in small groups of 2–6 children. One session takes 30–45 minutes. Each session includes active, teacher-directed work, games in pairs or in small groups, and individual written practice.

*Italicised* sentences are suggestions for teacher’s verbal descriptions of the tasks or guidance for the children’s work. It is not necessary to use them as written, but rather, they are meant as illustrating the thinking behind the task for the reader.

The warm-up tasks in the beginning of the session contain number sequence tasks to prepare for the coming session, or a task revising the subject of the previous teaching session.

### Central aims

- understanding the concept of addition and subtraction
- understanding the concept of subtraction as taking-away and as the difference between numbers
- understanding the commutative principle and utilising it in addition
- add-one, add-two, and add-three calculation strategies in addition
- bonds of ten and doubles in addition, and utilising them in subtraction
- subtract-one, two, three, and five calculation strategies in subtraction
- the connection between addition and subtraction: the missing part in a number sentence and fact families
- fluency of addition and subtraction in the number range 1–10

### Equipment needed for the entire material

- small objects (e.g., bricks and sticks)
- counters
- dice
- an egg carton for each child (10 cups)
- a box
- a cloth
- a bag for addition and subtraction flash cards
- a beanbag or a soft ball
- dot cards and number cards, game boards, and worksheets (downloadable from the ThinkMath web site)

## TEACHING SESSIONS

	Core content	Materials needed	page
TEACHING SESSION 1	Add-one addition facts	<ul style="list-style-type: none"> <li>- beanbag or a soft ball</li> <li>- small objects (10/child)</li> <li>- egg cartons (1/child)</li> <li>- Attachments: Addition flash cards (+1 addition facts), Climb a Tree Game C and D</li> <li>- Worksheet: Focus on fluency (add 1)</li> </ul>	5
TEACHING SESSION 2	Add-two addition facts	<ul style="list-style-type: none"> <li>- 10 objects in a box</li> <li>- a cloth</li> <li>- blu-tack</li> <li>- Attachments: Dot cards 1-9, Addition flash cards (+1 and +2 addition facts), Ghosts</li> <li>- Worksheet: Focus on fluency (add 2)</li> </ul>	10
TEACHING SESSION 3	Doubles 1-5	<ul style="list-style-type: none"> <li>- small objects (10/child)</li> <li>- dice</li> <li>- Attachments: Addition flash cards (+1 and +2 addition facts), Picture cards of doubles, Space Game doubles</li> <li>- Worksheet: Doubles</li> </ul>	13
TEACHING SESSION 4	Bonds of ten I	<ul style="list-style-type: none"> <li>- 10 bricks (see, TS4)</li> <li>- dice</li> <li>- counters</li> <li>- Attachments: Aliens, Alien Tens Game</li> <li>- Worksheet: How many missing from ten?</li> </ul>	16
TEACHING SESSION 5	Bonds of ten II	<ul style="list-style-type: none"> <li>- 10 bricks/child (see, TS5)</li> <li>- Attachments: Dot cards 1-9, Number cards 1-9</li> <li>- Worksheet: Completing Bonds of Ten</li> </ul>	19
TEACHING SESSION 6	Bonds of ten III	<ul style="list-style-type: none"> <li>- 10 bricks</li> <li>- number cards (see, TS6)</li> <li>- egg cartons (1/child)</li> <li>- small objects (10/child)</li> <li>- dice</li> <li>- counters</li> <li>- Attachments: Triangle cards (bonds of ten), Completing a Ten Game</li> <li>- Worksheet: Missing part (bonds of ten)</li> </ul>	22
TEACHING SESSION 7	Add-three addition facts	<ul style="list-style-type: none"> <li>- 3 small objects</li> <li>- Addition flash cards (+3)</li> <li>- counters</li> <li>- Attachments: Dot cards 1-7, Number cards 1-7, Bug Game, Addition tasks for the Bug Game (add 3)</li> <li>- Worksheet: Focus on fluency (add 3)</li> </ul>	26
TEACHING SESSION 8	All addition facts 1-10	<ul style="list-style-type: none"> <li>- blu-tack</li> <li>- Attachments: all Addition flash cards, Ghosts, Ghost Hunt A and B</li> <li>- Worksheet: Focus on fluency (all addition problems)</li> </ul>	29

<b>TEACHING SESSION 9</b>	Subtract 1, 2, or 3	<ul style="list-style-type: none"> <li>- small objects (10/child)</li> <li>- egg cartons (1/child)</li> <li>- Attachment: Number line 1-10</li> <li>- Worksheet: Focus on fluency (subtract 1, 2, or 3)</li> </ul>	32
<b>TEACHING SESSION 10</b>	Subtract five	<ul style="list-style-type: none"> <li>- beanbag or a soft ball</li> <li>- dice</li> <li>- Attachments: Dot cards 6-10, Robber and Banker B</li> <li>- Worksheet: Subtract five (triangle subtraction facts)</li> </ul>	35
<b>TEACHING SESSION 11</b>	Subtract from ten and from doubles	<ul style="list-style-type: none"> <li>- small objects (10/child)</li> <li>- egg cartons (1/child)</li> <li>- counters</li> <li>- dice</li> <li>- Attachments: Dot cards 6-10, Triangle cards (-5, bonds of ten, doubles), Subtract from Ten Game</li> <li>- Worksheet: Focus on fluency (ten -, double -)</li> </ul>	38
<b>TEACHING SESSION 12</b>	Subtract numbers close to each other	<ul style="list-style-type: none"> <li>- 2 small objects</li> <li>- dice</li> <li>- counters</li> <li>- Attachments: Number line 1-10, Forest Game A and B</li> <li>- Worksheet: Focus on fluency (numbers close to each other)</li> </ul>	41
<b>TEACHING SESSION 13</b>	Missing number in subtraction	<ul style="list-style-type: none"> <li>- Post-it notes</li> <li>- small objects (10/child)</li> <li>- dice</li> <li>- Attachments: Triangle Cards (see, TS13), Sweeties Game</li> <li>- Worksheet: Missing number in subtraction</li> </ul>	44
<b>TEACHING SESSION 14</b>	Missing number in addition I	<ul style="list-style-type: none"> <li>- Post-it notes</li> <li>- small objects (10/child)</li> <li>- Attachment: Animals of the Savannah</li> <li>- Worksheet: Missing number in addition A</li> </ul>	47
<b>TEACHING SESSION 15</b>	Missing number in addition II	<ul style="list-style-type: none"> <li>- Post-it notes</li> <li>- dice</li> <li>- counters</li> <li>- Attachments: Triangle cards (see, TS15), Haunted House Game B</li> <li>- Worksheet: Missing number in addition B</li> </ul>	50

**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- saying the next number in a number sequence

**EQUIPMENT**

- beanbag, soft ball, or similar object that can be thrown

**TASK PROCEDURE**

*I will say a number. Think about which number comes straight after the one I've said. For example, if I say one, the number straight after it is... two.* Throw the beanbag to each child in turn, and say a number between 0–9. The beanbag can also be passed around by the children only, in which case one child says the first number, and the other child answers by saying the next number.

New addition facts:

$$\begin{array}{l} 5 + 1, 1 + 5, 6 + 1, \\ 1 + 6, 7 + 1, 1 + 7, \\ 8 + 1, 1 + 8, 9 + 1, \\ 1 + 9 \end{array}$$

**NOTE**

- In this task, it is easy to observe whether the child knows how to start counting from the middle of the number sequence, or whether they start counting from the previous numbers to get to the starting number. If the child always starts counting from the beginning (from one), it is good also to strengthen number sequence skills (e.g., reciting numbers forwards and backwards using a number line or number cards).

**TASK 1. Adding one****AIMS**

- saying the next number in a number sequence
- add-one addition facts and their commutative addition facts

**EQUIPMENT**

- ten small objects and an egg carton for each child

**TASK PROCEDURE**

*Now we will practise counting so that we always add one to a number.*

Hand out the objects and the egg cartons to the children.

I will tell a little counting story. Use the objects to make in the egg carton the same thing that happens in the story. For example, like this: Eddie has six trading cards. I will put six objects in the egg carton, to show how many cards (five up and one down). Eddie gets one card more. I will put one object more in the egg carton to show that Eddie got one card more. How many cards does Eddie now have altogether? Ask one of the children to write the addition fact on the board or on paper.

Go through the next addition facts using stories you make up yourself or utilising the ones given below, and write each addition fact on the board or on paper.

**5 + 1: Sam has five golf balls. He finds one golf ball more on the golf course. How many golf balls does Sam now have altogether?**

**7 + 1: There are seven people at the beach. One more person comes there. How many people are there at the beach now?**

**9 + 1: Ava has nine euros. She finds another euro on the ground. How many euros does Ava have now?**

For thinking together: At the end, examine the number sentences written. In what way are they alike? Do the children notice that the numbers in the starting situation and the end situation succeed each other in the number sequence? This can be illustrated by circling the number in the starting situation and in the end situation. Whenever we add one, the answer is the next number, as was in the number sequence task used as the warm-up task in the session.

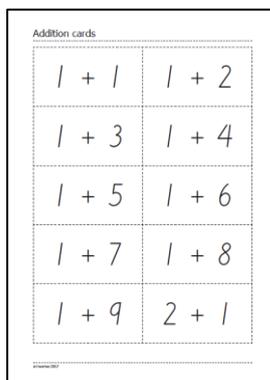
## TASK 2. Add-one addition facts with number symbols

### AIMS

- saying the next number in the number sequence
- add-1 addition facts and their commutative addition facts

### EQUIPMENT

- Attachment: Addition flash cards with add-one addition facts (e.g., 5 + 1 and 1 + 5)



## TASK PROCEDURE

In this task, mental computation is practised, using shortened counting (if a child doesn't yet remember the addition facts straight from memory, or doesn't know how to use the next-number rule).

The number cards are placed on the table in a deck, face down. Turn over one card, e.g.,  $6 + 1$ . *Now we will try to solve this addition fact without objects. First, put up one finger to show that in this addition fact, we add one (show the one on the card). Then, we will put the first number, six, in our own calculator, or our head and memory. Touch your head with your finger and say quietly in your mind, "six". Continue counting in the number sequence as far as your lifted fingers tell you to, like this: "seven" (touch your raised finger). When we added one to six, we got the answer seven.*

Continue in this way with the other addition facts. The children can take turns in turning over a card to be solved. In commutative addition facts (e.g.,  $1 + 4$ ), observe first, whether one of the children realises that the places of the numbers can be switched round in the addition fact. If not, revise the commutative principle ( $1 + 4$  and  $4 + 1$ ): same answers, but  $4 + 1$  is an easier addition fact to think and quicker to solve. If needed, you can illustrate the commutative principle in addition with, e.g., a tower of bricks with 1 blue brick and 4 red bricks. Whether you count the blue or the red bricks first, the answer is always the same.

Finally, sort the addition flash cards so that the commutative addition facts form a pair.

### NOTE

The task procedure can also be utilised later, when counting with larger numbers and where the other addend is 1, 2, or 3. The next step is just to keep the starting number in mind, without touching one's head with one's finger. The task procedure reinforces utilising the number sequence in the correct way: by reciting the numbers, one gets to the correct answer, but the whole number sequence doesn't have to be recited from the beginning. Compare this method, e.g., to counting using a number line, where the child usually says out loud the numerals of the number to be added. For example, in the addition fact  $5 + 2$ , number five is found on the number line, two steps forward are counted one, two, and then checking where one lands (7). This does not support the correct way of utilising a number line in counting, because one is not proceeding to larger numbers through reciting numbers on the number line.

## WORKING IN PAIRS

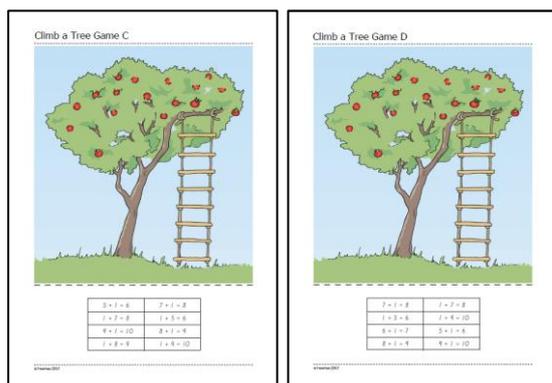
### TASK 1. Climb a Tree Game

#### AIMS

- practising add-1 addition facts

#### EQUIPMENT

- Attachment: Climb a Tree Game C and D, pencils



#### TASK PROCEDURE

One player gets Worksheet C, and the other, Worksheet D. The worksheets are folded down the middle, so that one side shows the tree and the other side shows the addition facts.

Player A reads the first series of addition facts to Player B. Player B says the answer to the addition fact. If the answer is correct, they get to cross out one space in their rope ladder. If the answer is wrong, they don't cross out anything. There are eight addition facts in each series. If the player gets the correct answer to all addition facts, they get to the top of the ladder and can thus climb the tree.

When Player A has read one series of addition facts, the players change turns. Now Player B will read addition facts from their list for Player A to answer.

After the first round, a second round is played. The aim is to get at least as good a result as in one's first round, or improve it.

#### NOTE

- Give the children the instructions by first demonstrating the game with one of the children.
- If a child does not remember the answer to an addition fact directly from memory, instruct the child to use their own "calculator", as in teacher-directed task 2, or to use the "next number in the number sequence" rule.

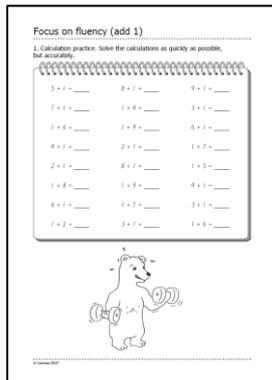
## INDIVIDUAL WORK

### AIMS

- fluency of add-1 addition facts, quick solving of addition facts

### EQUIPMENT

- Worksheet: Focus on fluency (add 1)



### NOTE

- Instruct the children to solve the addition facts as quickly as possible, but accurately; remind them that one can start counting on from the bigger number (why?).

## TEACHER-DIRECTED WORK

## WARM-UP TASK

## AIMS

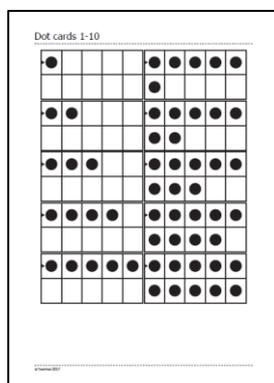
- revising add-1 addition facts

## EQUIPMENT

- Attachments: Dot cards 1–9, Addition flash cards with add-one addition facts (e.g.,  $5 + 1$  and  $1 + 5$ )
- a bag for the addition flash cards

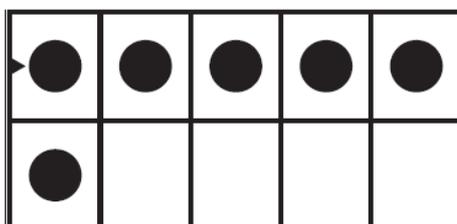
New addition facts:

$4 + 2$ ,  $2 + 4$ ,  $5 + 2$ ,  
 $2 + 5$ ,  $6 + 2$ ,  
 $2 + 6$ ,  $7 + 2$ ,  $2 + 7$ ,  
 $8 + 2$ ,  $2 + 8$



## TASK PROCEDURE

A) Add-one tasks with dot cards. Show one of the dot cards. *How many dots can you see? If I were to draw one more dot here, how many dots would there be then?* Go through all dot cards 1–9, so that each child can answer at least once. If needed, the answer can be illustrated by putting one object (e.g., a counter) onto the dot card.



B) Addition flash cards. Put the addition flash cards in a bag. Each child has a turn taking out one card, showing it, and reading the addition fact on it to the others. The task of the other children is to solve the addition fact on the card as quickly as possible. At first, the child can use the thumb sign when they have got the answer, and later, as the task progresses, the answer can be said by whoever gets it first.

## TASK 1. Hidden objects

### AIMS

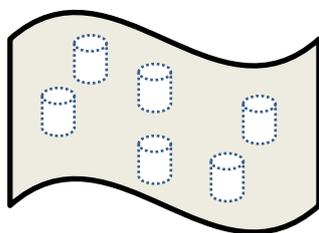
- practising add-2 addition
- shortened counting

### EQUIPMENT

- 10 objects in a box, a cloth
- Attachment: Addition flash cards ( $0 + 2$ ,  $1 + 2$ ,  $2 + 2$ ,  $3 + 2$ ,  $4 + 2$ ,  $5 + 2$ ,  $6 + 2$ ,  $7 + 2$ ,  $8 + 2$ )

### TASK PROCEDURE

On the table are the cloth, ten small objects in a box, and the addition flash cards shuffled and placed in a deck face down. One of the children turns over an addition flash card (e.g.,  $6 + 2$ ), and reads the addition fact out loud. After this, the child puts on the table as many objects as the first number indicates, and covers them up with a cloth. The teacher puts two more objects, equalling the other addend, onto the table. Now there are six objects under the cloth. If we add up the objects under the cloth and these two other objects, how many objects do we have altogether? Encourage the children to use shortened counting: first, place the six objects under the cloth “in your calculator” (head), and then continue reciting the number sequence by pointing at the objects on the table, seven, eight. Finally, the objects under the cloth are revealed, and it is stated that “ $6 + 2$  equals 8”.



‘six’



‘seven, eight’

Continue in the same way, until all addition flash cards have been used.

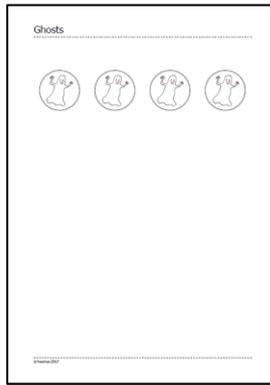
## TASK 2. Ghost Game

### AIMS

- strengthening add-1 or 2 addition facts in the number range 1–10

### EQUIPMENT

- Attachments: Addition flash cards with add-one or add-two addition facts (e.g.,  $3 + 1$  and  $2 + 6$ ), Ghosts
- blu-tack



## TASK PROCEDURE

The teacher attaches a picture of a ghost on 2–4 addition flash cards before the game, so that the children don't know how many ghosts there are. The cards are shuffled and placed in a deck on the table, face down.

The children take turns picking cards from the deck. When it is their turn, a child can pick as many cards as they dare. When the child has picked a card, they solve the addition fact. After this, they decide whether they will continue picking cards. If a ghost comes up, the child loses all cards they have collected during that turn to the ghost. These cards and the ghost card are moved to a deck to the side. If the child decides to stop, they get to keep the addition flash cards, and those collected during that turn are safe from the ghost, and cannot be lost in the next turn. The game is over when all cards have been turned. The winner is the child with the most cards.

The teacher's task is to observe how the child solves the addition facts, and to direct them if needed to use faster addition strategies (e.g., *Can you solve the addition fact starting directly from the bigger number?*).

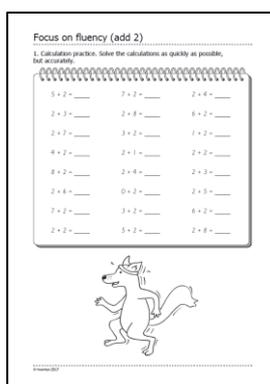
## INDIVIDUAL WORK

### AIMS

- fluency in add-2 addition facts

### EQUIPMENT

- Worksheet: Focus on fluency (add 2)



**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- quick solving of add-1 and 2 addition facts in the number range 1–10

**EQUIPMENT**

- Attachment: Addition flash cards, with add-one and add-two addition facts (e.g.,  $3 + 1$  and  $2 + 7$ )

**TASK PROCEDURE**

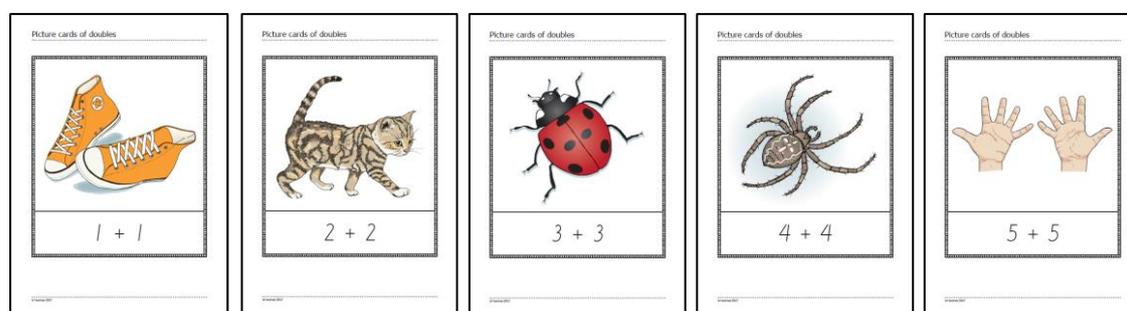
The addition flash cards are on the table in a deck. Turn over one card at a time. The quickest child to give the correct answer gets the card. If the child gives an incorrect answer, they lose one of the cards they have already collected. If more than one child gives a correct answer, the card is put at the bottom of the deck. When all addition facts have been solved, you can count who got the most cards.

**TASK 1. Doubles with pictures and objects****AIM**

- getting acquainted with doubles

**EQUIPMENT**

- an egg carton and 10 small objects for each child
- Attachment: Picture cards of doubles 1-5

**TASK PROCEDURE**

A) Show the cards to the children one by one and ask what they see in the pictures. The addition fact on the card has been hidden. Direct their attention to there being doubles in the picture, in other words, the same thing twice, for example two shoes, the cat has two front and two back

paw (or two on one side of its body, two on the other), a ladybird has three legs on one side of its body, three on the other, etc.

These cards are meant to act as mental images for doubles, and they can be attached on the wall of the classroom.

Think together, what addition fact is illustrated in the picture. Reveal the addition fact and solve it together.

B) Build doubles in the egg cartons with objects. *Place one object in the top row of the egg carton. Now, we will double the number by putting the same number of objects in the bottom row. What is the double of number one? (Two.)*

Do the same with the numbers 2–5. Empty the egg cartons between each double.

At the end, write on the board all doubles with the numbers 1–5, and their answers.

## WORKING IN PAIRS

### TASK 1. Space Game

#### AIMS

- strengthening doubles in the number range 2–10

#### EQUIPMENT

- a dot or number die for each pair, two different-coloured pencils
- Attachment: Space Game doubles



#### TASK PROCEDURE:

The players take turns rolling the die. The player whose turn it is doubles the number on the die and tells it out loud. For example, if the die shows a 3, the child says, “The double of three is six.” The task of the other child is to check whether the number was doubled correctly. The player finds the number corresponding to the answer for the addition fact on the board, and colours or marks the star with their pencil. If there are no more correct answers on the board, nothing is

marked. If the player rolls a six, they can colour any star. In this case, they must tell which number the number on their star is the double of. The game is over when every number on the board has been coloured. The winner is the player who has coloured more stars.

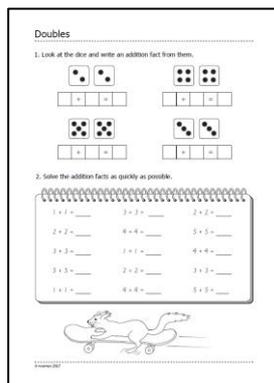
## INDIVIDUAL WORK

### AIMS

- fluency of doubles in the number range 1–10

### EQUIPMENT

- Worksheet: Doubles



**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- getting set for bonds of ten

**TASK PROCEDURE**

Bonds of ten are introduced with a version of the familiar song or rhyme “Five little monkeys”. Use fingers to illustrate what happens in the song. The children can choose the starting number or the animal.

*Five little monkeys (show with fingers) bouncing on the bed.*

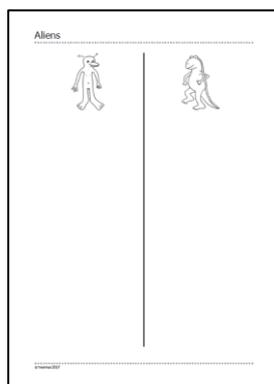
*How many more, to make it ten?*

**TASK 1. Separating ten into two parts****AIMS**

- separating ten into two parts in different ways

**EQUIPMENT**

- for each child, ten bricks that can be attached to each other (two different colours 5 and 5) OR a bead chain with ten beads (grouped in two different colours) OR 10 counters that are one colour on one side, a different colour on the other
- Attachment: Aliens



## TASK PROCEDURE

If the children are using bricks, they attach them together into a two-coloured bar (5 and 5). If they are using two-coloured counters, they place them on the table so that there are first five counters with one colour showing, then five with the other.

Here, there are pictures of two aliens. The aliens have got ten sweets. In which ways could the ten sweets be divided between the two aliens? The children solve the problem using the bricks, bead chain, or counters. Each child can tell their own solution, which are marked down in the worksheets (e.g., draw circles, or mark the solution with numbers). How many different solutions are found? What is the fairest way to divide the sweets? What is the least fair way?

## WORKING IN PAIRS

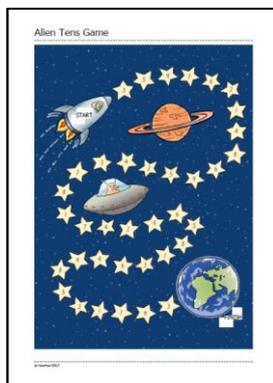
### TASK 1. Alien Tens Game

#### AIMS

- solving bonds of ten (using concrete equipment)

#### EQUIPMENT

- die and counters, if necessary, bricks, bead chains, or counters to illustrate
- Attachment: Alien Tens Game



## TASK PROCEDURE

The players take turns rolling the die and moving forward on the board according to the count. On each square on the board, the player says what the pair of that number is, for making ten. Fingers or equipment can be used to illustrate this. The game continues until both players reach the end.

## INDIVIDUAL WORK

### AIMS

- recognising the number missing from ten (ten-frame)

### EQUIPMENT

- Worksheet: How many missing from ten?

How many missing from ten?

1. How many are missing from ten?

 3 and ____ make 10	 8 and ____ make 10
 7 and ____ make 10	 6 and ____ make 10
 4 and ____ make 10	 2 and ____ make 10
 9 and ____ make 10	 0 and ____ make 10
 5 and ____ make 10	 1 and ____ make 10

**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- recognising the number missing from ten (ten-frame)

**EQUIPMENT**

- Attachment: Dot cards 1–9

**TASK PROCEDURE**

Show the children one dot card at a time.

*How many dots are there on this card? (e.g., 6) How many missing from ten? (4) Yes, because six and four make ten.*

The aim of the task is to recognise quantities quickly utilising grouped quantities in a ten-frame.

New addition facts:

$1 + 9$ ,  $2 + 8$ ,  $3 + 7$ ,  $4 + 6$ ,  $5 + 5$  and their commutative facts

**TASK 1. Split ten****AIMS**

- dividing ten into two parts: defining the other part

**EQUIPMENT**

- for each child, ten bricks that can be attached to each other (two different colours 5 and 5) OR a bead chain with ten beads (grouped in two different colours) OR 10 counters that are one colour on one side, a different colour on the other

**TASK PROCEDURE**

If the children are using bricks, they attach them together into a two-coloured bar (5 and 5). If they are using two-coloured counters, they place them on the table so that there are first five counters with one colour showing, then five with the other.

With all equipment, the aim is that the child can use groups of five to support counting, and doesn't hence have to count each bead or brick one-by-one.

*Split the bar of bricks into two parts so that there are five bricks on one bar. How many bricks are left on the other bar?*

When these bars – five and five – are attached together again, how many bricks are there then? (10). Write the addition fact  $5 + 5 = 10$  on the board.

Make other “splits” in the same way, and write the corresponding addition facts on the board.

## **WORKING IN PAIRS**

### **TAS 1. SNAP Game**

#### **AIMS**

- dividing ten into two parts: defining the other part

#### **EQUIPMENT**

- for each child, 10 bricks that can be attached to each other (two different colours, 5 and 5)

#### **TASK PROCEDURE**

Build a bar with the bricks so that the colours are grouped (five and five). The other child splits the bar from the place of their choice and hides the other bar behind their back or under the table. The task of the other player is to say how many bricks they see, and how many are hidden. The task is checked by bringing out the bar that was hidden. The players change turns.

The children can use their fingers for assistance in solving the task. They first put up all ten fingers. That is the number of bricks in the beginning. After this, they put down as many fingers as the bar left on the table has bricks (e.g., 6). The number of fingers that are left up show how many are missing from ten, in other words, how many bricks are hidden.

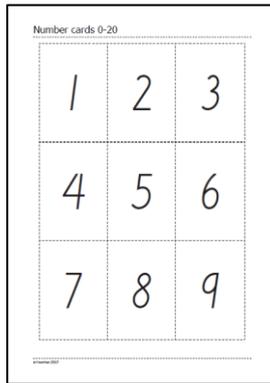
### **TASK 2. “Where Is Ten’s Pair?” Game**

#### **AIMS**

- dividing ten into two parts: defining the other part (number symbols)

#### **EQUIPMENT**

- Attachment: 2 x Number cards 1-9 (cards from different games are also suitable, e.g., a normal deck of cards, Uno or SkipBo cards)



### TASK PROCEDURE

One set of cards 1–9 is shuffled and placed on the table face up. The other set of cards 1–9 is also shuffled and the cards are placed on the table face down.

The aim of the game is to find the bond of ten for the topmost card of the deck from the cards on the table. For example, the card number 8 is topmost on the deck, and the players take turns in finding the number 2 card from the cards on the table. The player to find the required card during their turn gets to keep both cards. The game is played until all cards are used. The winner is the player with more pairs.

If needed, equipment (e.g., bricks, beads) can be used to illustrate what number fits as the bond of ten for the other number.

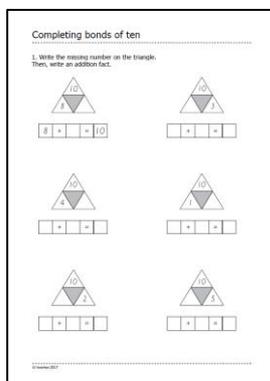
### INDIVIDUAL WORK

#### AIMS

- completing bonds of ten (number symbols)

#### EQUIPMENT

- Worksheet: Completing bonds of ten



## TEACHER-DIRECTED WORK

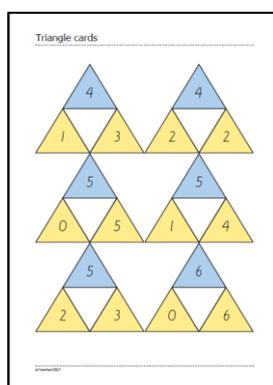
## WARM-UP TASK

## AIMS

- quick recollection of the other part of a bond of ten

## EQUIPMENT

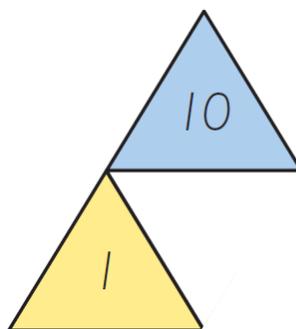
- 10 bricks (5 and 5 of different colours)
- Attachment: Triangle cards (10 cards)



## TASK PROCEDURE

A) SNAP. Proceed as in the pair work in Teaching Session 5, but this time, the teacher splits the bar of bricks and asks the children how many bricks are visible, and how many are missing.

B) Triangle cards. The teacher asks what are the missing addends of the Triangle cards (10 cards). In other words, one yellow triangle has been turned over and hidden. The children must solve the missing addend as quickly as possible.



C) Ping pong. The teacher says one number of a bond of ten, e.g., 6. The children must say the other number (4) of the bond of ten as quickly as possible. When the teacher every now and then says, “ping”, the children reply by saying, “pong”. The aim is to repeat several different bonds of ten fairly quickly.

## **WORKING IN PAIRS**

### **TASK 1. “Find Ten’s Pair” Game**

#### **AIMS**

- recalling the other part of bonds of ten (number symbols)

#### **EQUIPMENT**

- 2 x Number cards 1-9 (cards from different games are also suitable, e.g., a normal deck of cards, Uno or SkipBo cards)

#### **TASK PROCEDURE**

One set of cards 1–9 are placed in order on the table, face up. The other set of cards 1–9 are shuffled and placed on the table, face down.

The task of the players is to find the bonds of ten for the numbers visible on the table, in order 1–9. The players take turns turning over a card on the table. If it is the desired bond of ten, the card is placed under the number in question. After this, they look for the card for the next number in the number sequence. The game ends when the bond of ten has been found for all numbers.

If there are many number cards to use, both players can have their own decks and cards spread on the table. Now, they compete against each other in who is the first to get the bonds of ten for all their cards. The players take turns in finding the cards.

### **TASK 2. Go Fishing**

#### **TAVOITE**

- recalling the other part of bonds of ten (number symbols)

#### **MATERIAALI**

- 4 x Number cards 1-9 (cards from different games are also suitable, e.g., a normal deck of cards, Uno or SkipBo cards)

#### **TASK PROCEDURE**

A game for 2–4 players. The aim is to collect as many bonds of ten as possible. The cards are shuffled. Each player is dealt five cards. The rest of the cards are placed on the table in a deck as a “fishpond”. The players check to see whether they are holding in their hand cards that make a bond of ten, e.g., 8 and 2. The player can collect these cards for themselves. If at any point in the game a player notices they are holding cards for a bond of ten, they can collect them for themselves.

After this, the game begins for real. The first asker is chosen. They ask any other player for a number they need, in order to form a bond of ten. For example, if the player is holding the cards 2, 6, and 9, they can ask another player if they have the cards 8, 4, or 1, but only one number per turn. If the other player has the number asked for, they give it to the asker, who can then collect the bond-of-ten cards for themselves. If the player doesn't have the card asked for, they say, "Go fishing", which means that the asker must pick one card from the deck. If the player gets a card that forms a bond of ten with one of the cards they are holding, they can collect these cards. The turn for being the asker moves on. When a player runs out of cards, they pick five more cards from the deck.

The game ends when a pair has been found for all cards. The winner is the player with most bond-of-ten pairs.

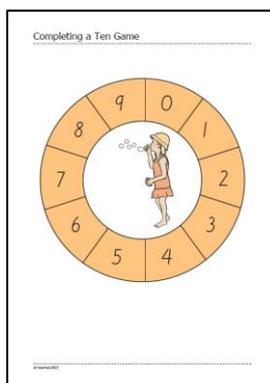
### TASK 3. Completing a Ten Game

#### AIMS

- recalling the other part of bonds of ten (number symbols)

#### EQUIPMENT

- two egg cartons for each pair and 20 small objects, a die and counters
- Attachment: Completing a Ten Game



#### TASK PROCEDURE

The aim of the game is to be the first to get ten bonds of ten correctly. The players place their counters on any square on the board. They both have in front of them an egg carton and 10 small objects. One player rolls the die and moves forward on the board according to the count. If the player can say what is the bond of ten of the number in the square they land on, they get to put one object in their egg carton. The players change turns. The winner is the first player to have each one of their ten objects in their egg carton. Gathering objects in the egg carton also illustrates how many correct answers the player still needs, in order to have an object in each cup of the egg carton.

## INDIVIDUAL WORK

### AIMS

- practising bonds of ten, missing addend

### EQUIPMENT

- Worksheet: Missing part (bonds of ten)

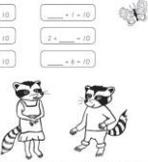
Missing part (bonds of ten)

1. Tick the box, if the addition fact has been solved correctly.

$8 + 2 = 10$ <input type="checkbox"/>	$5 + 4 = 10$ <input type="checkbox"/>	$7 + 3 = 10$ <input type="checkbox"/>
$7 + 4 = 10$ <input type="checkbox"/>	$4 + 7 = 10$ <input type="checkbox"/>	$4 + 6 = 10$ <input type="checkbox"/>
$5 + 5 = 10$ <input type="checkbox"/>	$3 + 8 = 10$ <input type="checkbox"/>	$2 + 8 = 10$ <input type="checkbox"/>
$6 + 4 = 10$ <input type="checkbox"/>	$5 + 6 = 10$ <input type="checkbox"/>	$2 + 8 = 10$ <input type="checkbox"/>

2. Write the missing number.

$8 + \underline{\quad} = 10$	$7 + \underline{\quad} = 10$
$\underline{\quad} + 4 = 10$	$\underline{\quad} + 7 = 10$
$5 + \underline{\quad} = 10$	$2 + \underline{\quad} = 10$
$\underline{\quad} + 4 = 10$	$\underline{\quad} + 6 = 10$



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**TEACHER-DIRECTED WORK****WARM-UP TASK****AIM**

- reciting numbers from a given number three steps forwards

New addition facts:

 $3 + 4, 4 + 3, 3 + 5,$   
 $5 + 3, 3 + 6, 6 + 3$ **EQUIPMENT**

- 3 small objects or a water-soluble marker pen, if the dot cards have been laminated
- Attachments: Dot cards 1–7, Number cards 1–7

**TASK PROCEDURE**

A) Dot cards. Show the children one dot card (e.g., 5). *How many dots are there in the picture? If I were to draw three dots more, how many dots would there be then?* Let the children try to solve the problem without objects first. Then, demonstrate the answer with objects or by drawing three dots on the card. *At first, there were five dots. I add three dots and continue to count at the same time: six, seven, eight.*

Do the same with all dot cards 1–7.

B) Number cards. Hold the number cards in your hand and let the children take turns picking a card. *Your task is to count forwards three numbers from the number on the card. You can use your own calculator – your head – to help. First put up three fingers (the number to be added). Then, put into your memory the number on the card (e.g., 4) by touching your head. Count the next three numbers so that you touch each finger you put up, in turn. For example, like this: four (touch your head), five (touch the first finger), six (touch the second finger), seven (touch the third finger). When we counted three numbers forwards from number four, we got to number seven.*

Do the same with all number cards 1–7.

**TASK 1. Add-three addition facts****AIMS**

- solving add-3 addition facts
- shortened counting

**EQUIPMENT**

- Attachment: Addition flash cards ( $1 + 3, 2 + 3, 3 + 3, 4 + 3, 5 + 3, 6 + 3, 7 + 3$ )

## TASK PROCEDURE

Spread the addition flash cards on the table. *What addition facts do you remember from before?* (The ones used before are  $1 + 3$ ,  $2 + 3$ ,  $3 + 3$ , and  $7 + 3$ ). *What is the answer to the addition fact? How did you solve it quickly?* (It can be remembered directly using, e.g., doubles or bonds of ten; one can start counting from the bigger number, etc.)

Leave three new addition facts on the table a ( $4 + 3$ ,  $5 + 3$ , and  $6 + 3$ ). Show each addition fact at a time. *How would you solve this addition fact?* The children can have several very different ways of solving the addition fact.

Introduce shortened counting as one solution worth using, if one cannot remember the answer directly. In shortened counting, one says the starting number (the bigger addend) quietly in one's head, and then counts on three numbers. If needed, three fingers can be lifted to support one's memory.

## WORKING IN PAIRS

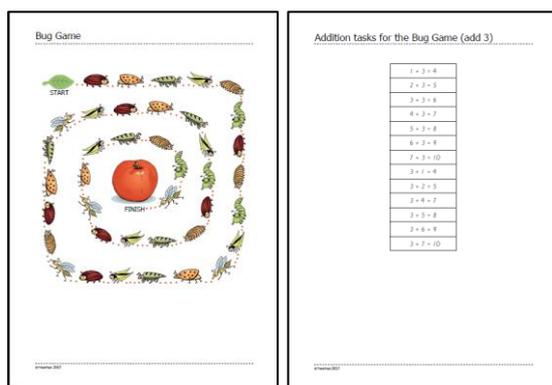
### TASK 1. Bug Game

#### AIMS

- strengthening add-3 addition facts in the number range 1–10

#### EQUIPMENT

- Attachments: Bug Game, Addition tasks for Bug Game (add 3)
- a die, counters for moving on the game board, pencils (or small objects as counters for correct answers)



## TASK PROCEDURE

The players take turns rolling the die, and move on the board according to the count. When one player has moved, the other player gives the addition fact of their choice from the Addition tasks worksheet, for the player to solve. If the player gives the correct answer, they draw a line on a separate piece of paper. Alternatively, a counter can be gained for a correct answer. When both

players have reached the end of the board, they count who solved more addition facts along the way.

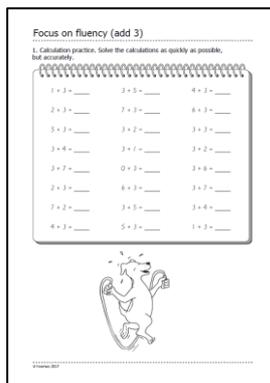
## INDIVIDUAL WORK

### AIMS

- fluency in add-3 addition facts, quick solving of the addition

### EQUIPMENT

- Worksheet: Focus on fluency (add 3)



**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- quick solving of addition facts in the number range 1–10

**EQUIPMENT**

- Attachment: all Addition flash cards (approximately 20–30 cards)

**TASK PROCEDURE**

The teacher has the addition flash cards in front of them on the table, in a deck. They turn over one card at a time, so it can be seen. The first child to give the correct answer gets the card. If the child gives an incorrect answer, they lose a card they have already collected. If more than one child gives the correct answer, the card is placed at the bottom of the deck. When all addition facts have been solved, count who got the most cards.

**TASK 1. Ghost Game****AIMS**

- strengthening addition in the number range 1–10

**EQUIPMENT**

- Attachments: all Addition flash cards, Ghosts
- blu-tack

**TASK PROCEDURE**

Before the game, the teacher attaches pictures of ghosts on 3–4 addition flash cards, so that the children don't know how many ghosts there are. The addition flash cards are shuffled and placed on the table in a deck, face down.

The children take turns turning over a card from the deck. During their turn, the child can turn over as many cards as they dare. When the child has turned over a card, they solve the addition fact on the card. After this, they decide whether to continue turning over cards. If a ghost comes up, the child loses all cards they collected during that turn to the ghost. These cards are placed in a deck to one side, along with the ghost card. If the child decides to stop turning over cards, they get to keep the addition flash cards, and the cards collected during that turn are safe from the ghost and cannot be lost in the next turn. The game ends when all cards have been turned over. The winner is the child with the most cards at the end of the game.

## WORKING IN PAIRS

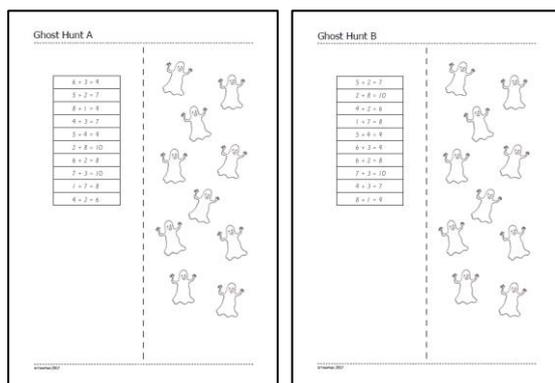
### TASK 1. Ghost Hunt

#### AIMS

- strengthening addition in the number range 1–10

#### EQUIPMENT

- Attachments: Ghost Hunt A and B, pencils



#### TASK PROCEDURE

One player gets Worksheet A, and the other, Worksheet B. The worksheets are folded lengthwise so that the ghosts are visible one side and the addition facts on the other.

Player A gives Player B the first series of addition facts. Player B gives the answers to the addition facts. If the answer is correct, they can cross out one ghost. Thus, this ghost has been hunted down. If the answer is incorrect, the player doesn't cross out anything. There are ten addition facts in each series. If the player gets all ten addition facts right, they succeed in hunting down all the ghosts.

When Player A has given one series of addition facts to be solved, the players change turns. Now, it is Player B's turn to give addition facts from their list for Player A to solve.

After the first round, another round is played. The aim is to get at least as good a result as in the first turn, or improve one's result.

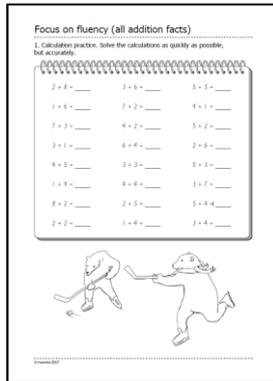
## INDIVIDUAL WORK

### AIMS

- strengthening addition in the number range 1–10
- quick solving of addition facts

### EQUIPMENT

- Worksheet: Focus on fluency (all addition facts)



## TEACHER-DIRECTED WORK

## WARM-UP TASK

## AIMS

- saying the previous number in the number sequence

## TASK PROCEDURE

Play a frog finger rhyme.

**Ten** little frogs

Playing on a lily pad.

One wants to hop,

But falls in the water (plop!, put down one finger),

Now we say, “Hello!”

*How many frogs are on the lily pad now?*

**Nine** little frogs...

**One** little frog,

Playing on a lily pad.

It wants to hop,

And say hello:

“HELLO! HELLO!”

New subtraction facts:

$$10 - 1, 9 - 1, 8 - 1, 7 - 1, 6 - 1$$

$$10 - 2, 9 - 2, 8 - 2, 7 - 2, 6 - 2$$

$$10 - 3, 9 - 3, 8 - 3, 7 - 3, 6 - 3$$

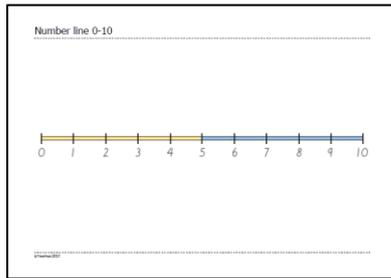
## TASK 1. Subtracting one, two, or three

## AIMS

- subtract-1, 2, or 3 subtraction facts

## EQUIPMENT

- ten small objects and an egg carton for each child
- Attachment: Number line 1–10



## TASK PROCEDURE

Now, we will practise counting so that we subtract one, two, or three from a number.

Hand out the objects and egg cartons to the children.

I will tell a little counting story. Use the objects to make in the egg carton what happens in the story. For example, like this: Samuel has seven dinosaur toys. I will put seven objects in the egg carton to show how many dinosaurs (always fill in the top row first, and then the bottom row, from left to right). Samuel lends one dinosaur to his little brother. I will take one object away from the egg carton, to show that this dinosaur is being lent to the little brother (the last object placed in the carton). How many dinosaurs does Samuel now have altogether? Write the subtraction fact of the counting story with numbers on the board or on paper ( $7 - 1 = 6$ ). If needed, explain that the minus sign tells that the second number is taken away from the first number.

Go through the following subtraction facts with stories you make up yourself, or using the stories below, and write each subtraction fact on the board or on paper.

**8 - 1: There are eight bananas on the table. Jake eats one of them. How many bananas are left on the table?**

**9 - 1: Nine children are playing in the sand pit. One child goes away to the swings. How many children are in the sand pit now?**

Examine the subtraction facts created using the number line. Whenever one is taken away from a number, the answer is the previous number in the number sequence.

**6 - 2: Mia has six balloons. Two of them float away. How many balloons is Mia left with?**

**8 - 2: There are eight ships in the port. Two of them sail off. How many boats are left in the port?**

Examine the subtraction facts formed, using the number line. Whenever two are taken away from a number, you jump back two numbers on the number line.

**7 - 3: There are seven cars in the parking lot. Three cars drive away. How many cars are left in the parking lot?**

**9 - 3: There are nine pumpkins growing in the vegetable patch. Amelia picks three of them. How many pumpkins are there left in the vegetable patch?**



## TEACHER-DIRECTED WORK

## WARM-UP TASK

## AIMS

- strengthening subtract-1, 2, or 3 subtraction facts

## EQUIPMENT

- a beanbag, soft ball, or similar object that can be thrown
- Attachment: Dot cards 6–10

## TASK PROCEDURE

A) Show one of the dot cards. *How many dots can you see? If I were to cover one/two/three dots, how many dots would you see then?* If needed, the answer can be illustrated by covering one/two/three dots with your fingers.

B) *I will say a subtraction fact. Give the answer as quickly as possible.* Throw the beanbag to each child in turn, and say a subtraction fact in which the subtrahend is one, two, or three.

New subtraction facts:

10 - 5, 9 - 5, 8 - 5,  
7 - 5, 6 - 5

## TASK 1. Subtract five

## AIMS

- practising subtract-5 subtraction facts

## TASK PROCEDURE

*Now, we will practise counting so, that we take away five from a number.*

*I will tell a little counting story. Show with your fingers what happens in the story.*

**8 - 5:** *There are eight ice-cream cones in the freezer. The children eat five of them. How many ice-cream cones are there left in the freezer?*

Think together, what is the easiest way to subtract five using your fingers. Do you need to put down five fingers one by one? (No, you can put down all fingers in one hand at the same time.) You can show the same with dot cards: hide five, that is, the whole top row.

**7 - 5:** *There are seven children playing in the yard. Five of the children are told to go home for dinner. How many children are left playing in the yard?*

**9 - 5:** *In the evening, the temperature is plus nine degrees. During the night, the temperature falls five degrees. What is the temperature in the morning?*

**6 - 5: There are six candles on Sarah's birthday cake. She manages to blow out five of them. How many candles are left burning?**

**10 - 5: Ten birds are sitting on a roof. Five birds fly away. How many birds are left on the roof?**

Write the subtraction facts and their answers on the board.

## WORKING IN PAIRS

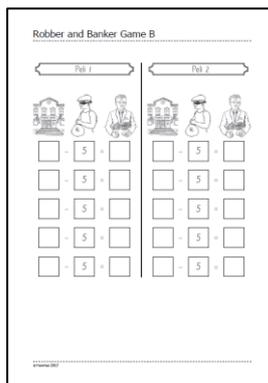
### TASK 1. Robber and Banker Game

#### AIMS

- subtracting five from the numbers 5–10

#### EQUIPMENT

- a die with the numbers 5–10 for each pair, a pencil
- Attachment: Robber and Banker B



#### TASK PROCEDURE

The players have the game board in front of them. Two rounds will be played. In the first round, one of the players is the robber and the other is the banker. In the second round, the players change roles. The banker rolls the die (e.g., 6) and writes the count of the eyes in numbers in the bank square. The robber steals five golden coins from the bank: “I steal five from you, you are left with one.” After this, the banker writes on the game board the number sentence describing what happened, as well as saying what happened: “Six minus five is equal to one.” The other series of five is played in the same way, but switching roles.

## INDIVIDUAL WORK

### AIMS

- strengthening subtract-1, 2, or 3 subtraction facts

### EQUIPMENT

- Worksheet: Subtract five (triangle subtraction facts)

Subtract five (triangle subtraction facts)

1. Decide which numbers are missing from the triangles.  
Write two subtraction facts.

7	-	5	=	
7	-		=	

	-	5	=	
	-		=	

4	-	3	=	
4	-		=	

	-	3	=	
	-		=	

4	-	3	=	
4	-		=	

	-	3	=	
	-		=	

10	-	5	=	
10	-		=	

	-	5	=	
	-		=	

**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- subtracting 5 from the numbers 6–10

**EQUIPMENT**

- Attachments: Dot cards 6–10, Triangle cards (10 - 5, 9 - 5, 8 - 5, 7 - 5, 6 - 5)

**TASK PROCEDURE**

A) Show one of the dot cards. *How many dots can you see? If we subtract five from this number, how many dots are there then?* If needed, the answer can be illustrated by covering the five dots in the top row. The children can also be instructed to take away five from the quantity shown in the card in their minds. If needed, fingers can also be used in illustrating the subtraction. In this instance, the taking away will be done using all the fingers of one hand at once.

B) Fold the triangle card over so that the parts of the subtract-five subtraction fact are visible (e.g., 8 and 5). Ask the children what subtraction fact can be made from the numbers and what is the hidden number, in other words, the answer to the subtraction fact.

New subtraction facts:

10 - 4, 10 - 6,  
10 - 7, 10 - 8, 10 - 9,  
10 - 10, 8 - 4

**TASK 1. Subtracting from ten and from a double****AIMS**

- utilising bonds of ten and doubles in subtraction
- forming fact families from three numbers

**EQUIPMENT**

- coloured pencils and paper
- Attachments: Dot cards 1–10, Triangle Cards (bonds of ten and doubles)

**TASK PROCEDURE**

For this task, the children are expected to know bonds of tens and doubles well in the number range 1–10, so they can utilise them also in subtraction.

A) Dot cards. Show one dot card (e.g., 8). *How many dots are there in the card? How many dots more should we draw, so that there would be ten dots? Write a bonds-of-ten addition fact on the board. If there were ten dots at first, how many of them have been taken away/wiped out? (2) How many dots are left? (8) Write a subtraction fact showing this:  $10 - 2 = 8$ .*

Do the same with the other dot cards.

Think together, how the bonds of ten already learned can be used when the first part of a fact is ten. (You can think what is the bond of ten of the second number (subtrahend) in the subtraction fact.)

B) Triangle cards. First do a few example facts, after which the children do the same in pairs.

First show one bonds-of-ten triangle card, with the answer hidden (e.g., 6 and 4). *What kind of an addition fact can we make with the numbers on this card? Can we make more than one addition fact?* (Yes:  $6 + 4$  and  $4 + 6$ .) Reveal the answer and write the addition facts on the board. *If I turn back and hide the other yellow number, what kind of a subtraction fact can we make with the numbers? Can we make more than one subtraction fact?* (No.) Reveal the answer and write the subtraction fact on the board. Fold back and hide the other yellow number to form a new subtraction fact that is also written on the board. The three numbers were used to form four facts that can be called fact families.

Give one triangle card at a time to each pair of children. The pair is to write four facts from three numbers. It is good to instruct the children to do the addition facts first and then the subtraction facts. If needed, fingers can be used to illustrate. Each pair can do the facts for 3–5 cards.

Observe whether the children notice how the doubles learned earlier can easily be used to assist with subtraction.

## WORKING IN PAIRS

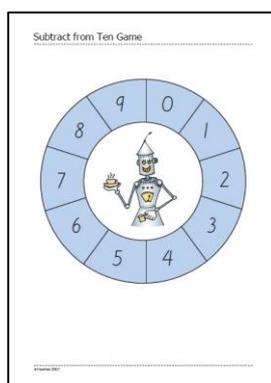
### TASK 1. Subtract from Ten Game

#### AIMS

- subtraction from ten

#### EQUIPMENT

- 2 egg cartons and 20 small objects, a die, and counters for each pair
- Attachment: Subtract from Ten Game



## TASK PROCEDURE

The aim of the game is to count correctly ten bonds-of-ten subtraction facts, and get one's egg carton full of objects. The players place their counters on any square on the game board. Both have an egg carton and 10 small objects in front of them. One player rolls the die and moves on the board according to the count. In each square, the player subtracts that number from ten: for example, in square 4, they subtract four from ten, and state that the answer is six. After a correct answer, the player can place one object in their egg carton. The players change turns. The winner is the first player to have all ten objects in the egg carton. Collecting objects in the egg carton also illustrates how many correct answers the player still needs, in order to have an object in each of the ten cups in the carton.

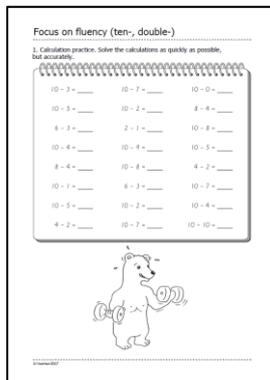
## INDIVIDUAL WORK

### AIMS

- fluency in the “subtracting from ten and from doubles” facts

### EQUIPMENT

- Worksheet: Focus on fluency (ten-, double-)



## TEACHER-DIRECTED WORK

## WARM-UP TASK

## AIMS

- revising the “subtract from ten” and “subtract from doubles” subtraction facts

New subtraction facts:

$7 - 4$ ,  $6 - 4$ ,  $5 - 4$ ,  $8 - 6$ ,  
 $7 - 6$ ,  $9 - 7$ ,  $8 - 7$ ,  $9 - 8$

## TASK PROCEDURE

Ping Pong. The teacher gives a “subtract from ten” fact or a “subtract from doubles” fact (e.g.,  $10 - 4$ ). The children must give the answer together, as quickly as possible. When every now and then the teacher says, “ping”, the children reply with, “pong”. The aim is to repeat several facts quite rapidly.

## TASK 1. Numbers close to each other in subtraction

## AIMS

- solving subtraction facts by counting forward, when the numbers are close to each other

## EQUIPMENT

- two small objects
- Attachment: Number line 0–10

## TASK PROCEDURE

Write on the board two subtraction facts, one in which the parts of the fact are far from each other, the other with parts that are close to each other, e.g.,  $9 - 1$  and  $9 - 7$ . Go through the subtraction facts one by one. *In what ways can you solve the subtraction fact on the board?* Let the children tell how they solve it. At the end, show and explain the following method.

Place the small objects on the numbers 9 and 1 on the number line. *The numbers are far away from each other. Because one is a small number, it is quick and easy to subtract from nine by counting back one number. The difference between the numbers one and nine is eight. When you subtract one from nine, the answer is eight.*

Place the small objects on the numbers 9 and 7 on the number line. *These numbers are close to each other. Seven is quite a big number. Subtracting it from nine is not quick, and you may make mistakes when counting. Here, it is good to use counting forward to solve the subtraction fact. How many steps forward do you have to take from seven, on order to reach nine?* Show on the number line: *Eight, nine, that is two steps.* You can do the same also with your fingers: count on two numbers starting from seven, putting fingers up at the same time. *The difference between the numbers seven and nine is two. When you subtract seven from nine, you get two.*

Write the following subtraction facts on the board, and solve them by using counting-forward to help.

$8 - 6$

$6 - 4$

$8 - 7$

$7 - 4$

$9 - 8$

## WORKING IN PAIRS

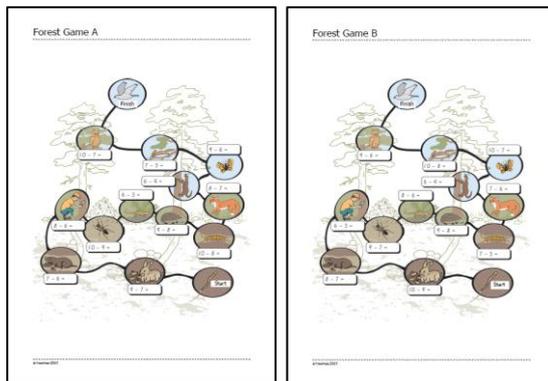
### TASK 1. Forest Game

#### AIMS

- subtracting numbers close to each other

#### EQUIPMENT

- counters for the players, two dice (with only the numbers 1–3, twice), pencils
- Attachment: Forest Game A and B



#### TASK PROCEDURE

The players have a game board each. They place their counters in the start circle. The player rolls two dice. If the count on either die (1, 2, or 3) is the answer to the subtraction fact in the circle, the player gets to move on to the next circle. During their next turn, they get to try to solve the subtraction fact in this new circle. The player also writes down the answer to each subtraction fact. If the count on neither die is the answer to the subtraction fact, the player doesn't move their counter, but tries to get the correct answer to the subtraction fact during their next turn.

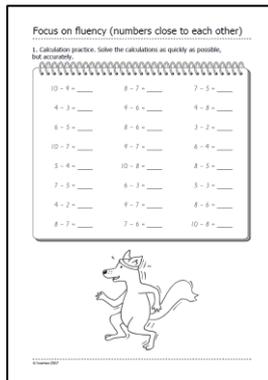
## INDIVIDUAL WORK

### AIMS

- fluency in “subtracting numbers close to each other” subtraction facts

### EQUIPMENT

- Worksheet: Focus on fluency (numbers close to each other)



**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- revising subtraction facts in which the minuend and subtrahend are numbers close to each other

**EQUIPMENT**

- Attachment: Triangle cards in which the parts of a subtraction fact are numbers close to each other (e.g.,  $10 - 9$ ,  $10 - 8$ ,  $10 - 7$ ,  $9 - 8$ ,  $9 - 7$ ,  $9 - 6$ ,  $8 - 7$ ,  $8 - 6$ ,  $8 - 5$ ,  $7 - 6$ ,  $7 - 5$ ,  $6 - 5$ ,  $6 - 4$ )

**TASK PROCEDURE**

Hold the triangle cards in your hand so that the children cannot see them. Fold back the answer of the triangle card. Show the children one card at a time and give them the subtraction fact on the card. Agree beforehand, whether the children answer all together, or whether the quickest child gets to answer. If you want to add competition to the game, the card can be given to the quickest child to give the answer. The winner is the child with the most cards at the end. If a child gives an incorrect answer, they lose one card already collected.

**TASK 1. Missing subtrahend****AIMS**

- solving the missing subtrahend in a subtraction fact

**EQUIPMENT**

- 10 small objects (e.g., bricks) for each child
- Post-it notes

**TASK PROCEDURE**

A subtraction fact has been written on the board, and the subtrahend covered with a post-it note (e.g.,  $8 - \square = 3$ ).

*In this task, one number has been covered with a post-it note. Eight minus something is equal to three. You can add a story to the subtraction fact: There are 8 children in the classroom. Some children leave, so that there are 3 children left in the classroom. How many children have left the classroom? Let's look at how we can find out what number has been covered with a post-it note, in other words, how many children have left the classroom.*

Put as many objects on the table as in the starting situation (8).

Because we know how many are left – three – we will use this to solve the missing number. We don't know how many to take away, but we can see that three are left. Move three objects to one side. What we have left (5) is what was taken away from the starting number. So, if out of eight children, five children leave, there are three children left in the classroom.

Let one of the children reveal the hidden number.

Solve the rest of the subtraction facts below in the same way. Let the children first think how to find out the hidden number using the objects. Demonstrate, or let one of the children demonstrate, the correct answer.

E.g.,

$6 - x = 4$	$5 - x = 2$
$9 - x = 6$	$8 - x = 5$
$10 - x = 7$	$7 - x = 4$

## WORKING IN PAIRS

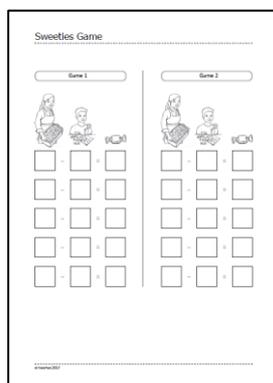
### TASK 1. Sweeties Game

#### AIMS

- solving the missing number in subtraction

#### EQUIPMENT

- two dice (one die has the numbers 1–6, and the other, 6–10 and a side left blank), pencils, ten small objects
- Attachment: Sweeties Game



## TASK PROCEDURE

The players have the game board in front of them. Two rounds will be played. In the first round, one of the players is the shopkeeper, who gets to decide how many sweeties they have. They roll the 6–10 die, and write the count on the die in the shopkeeper column. If the blank side is left showing, the player can choose a number between 6 and 10. The other player gets to decide how many sweeties are left after a certain amount has been eaten. This player rolls the 1–6 die, and writes the count of the die in the sweetie column. When a subtraction fact with an unknown subtrahend has been written using the dice, the players must solve how many sweeties were eaten. Here, they can use objects to help. The players write the missing number on the worksheet and check whether the answer is correct. The other five parts are played in the same way, switching roles after each turn.

## INDIVIDUAL WORK

### AIMS

- solving the missing subtrahend in a subtraction fact

### EQUIPMENT

- Worksheet: Missing number in subtraction

Missing number in subtraction

1. Solve the missing number.

$8 - \square = 2$	$6 - \square = 5$
$7 - \square = 4$	$10 - \square = 3$
$4 - \square = 2$	$4 - \square = 1$
$8 - \square = 4$	$9 - \square = 6$



2. Place the numbers from the counting story in the subtraction fact, and solve the missing number.

A) Alex has five lollipops and he ate some of them. How many lollipops did Alex eat?

$\square - \square = \square$
-------------------------------

Answer: \_\_\_\_\_ lollipops

B) Sarah has eight balloons. She gives some of them to her friend. How many balloons did Sarah give to her friend?

$\square - \square = \square$
-------------------------------

Answer: \_\_\_\_\_ balloons

**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

- revising addition in the number range 1–10

**EQUIPMENT**

- Post-it notes

**TASK PROCEDURE**

Ten addition facts from the number range 1–10 have been written on the board, with their answers covered with a post-it note.

E.g.,

$5 + 2 = X$	$1 + 9 = X$
$1 + 7 = X$	$2 + 8 = X$
$6 + 2 = X$	$1 + 5 = X$
$2 + 4 = X$	$7 + 2 = X$

*One number of the addition fact, in this case, the answer, has been covered with a post-it note. What number has been hidden? Go through each addition fact.*

**TASK 1. Missing number in addition****AIMS**

- solving the missing number in addition, when one addend is 1 or 2

**EQUIPMENT**

- post-it notes and 10 small objects (e.g., bricks) for each child

**TASK PROCEDURE**

An addition fact with one addend covered with a note (e.g.,  $2 + \square = 9$ ) has been written on the board.

In the previous task, the answer to the addition fact was covered. Now, the other number in the addition fact is covered. Two plus something is equal to nine. Let's think how we can find out what number has been covered.

Put on the table as many bricks as the answer to the addition fact (9).

Move away as many bricks as is the other addend (2).

What we have left is the number missing from the addition fact, which here is 7. Two plus seven equals nine. (Show by putting the bricks back together again into one group.)

Let one of the children reveal the hidden number.

Solve the addition facts below in the same way. Let the children first think for themselves how to find out the hidden number using the objects. Demonstrate or let one of the children demonstrate the correct answer.

E.g.,

$2 + x = 6$	$1 + x = 8$
$x + 1 = 8$	$x + 2 = 9$
$x + 2 = 7$	$2 + x = 10$

#### NOTE

- Little by little, the children learn while doing the task that to find out the other addend, they must subtract the other addend from the answer to the addition fact. However, this often has to be taught to the children. If the child knows the partitions of the number, they may be able to say what the missing addend is directly ("two and four is six"). The method learned through subtraction can, however, also be utilised in a larger number range. Also, the subtraction method directs the child towards a way of thinking that supports writing the number sentence describing the fact (e.g.,  $1 + x = 8 \rightarrow 8 - 1 = 7$ ).
- In the other calculation strategy, numbers are counted from one addend onwards, e.g., putting up a finger to support memory, until the answer is reached. The number of fingers put up is the missing addend. This strategy will be covered in the next Teaching Session. This is an effective strategy when the numbers are close to each other. E.g., in the addition fact  $6 + x = 8$ , one counts from six to eight – seven, eight – putting up two fingers.

## INDIVIDUAL WORK

### AIMS

- solving the missing number in addition

### EQUIPMENT

- Worksheet: Solving the missing number in addition A

Missing number in addition A

1. Circle the sum, or the addend for the addition fact, in bold. Circle out the other, know addend. Write missing number in the addition fact. Check the calculation.

$1 + \underline{\quad} = 7$	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
$2 + \underline{\quad} = 8$	<input type="checkbox"/>
$\underline{\quad} + 1 = 9$	<input type="checkbox"/>
$2 + \underline{\quad} = 10$	<input type="checkbox"/>
$2 + \underline{\quad} = 6$	<input type="checkbox"/>
$\underline{\quad} + 2 = 7$	<input type="checkbox"/>
$\underline{\quad} + 2 = 9$	<input type="checkbox"/>
$1 + \underline{\quad} = 8$	<input type="checkbox"/>



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**TEACHER-DIRECTED WORK****WARM-UP TASK****AIMS**

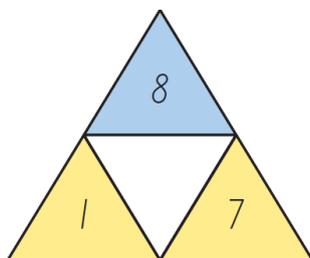
- solving the missing number in addition using subtraction

**EQUIPMENT**

- Attachment: Triangle cards, with 1 or 2 as the other addend

**TASK PROCEDURE**

Fold back and hide the other addend of a triangle card. E.g., in the 1, 7, 8 card, hide the number 7.



How can we find out the missing number in the addition fact  $1 + \underline{\quad} = 8$ ?

The other addend is subtracted from the answer. Can the children solve the problem without concrete assistance? If needed, demonstrate using e.g., bricks.

**TASK 1. Solving the missing number using addition****AIMS**

- solving the missing number in addition, when the other addend and the answer are numbers close to each other

**EQUIPMENT**

- Post-it notes
- Attachment: Triangle cards, where the other addend is 1, 2, or 3 (e.g., the 2, 5, 7 card)

**TASK PROCEDURE**

An addition fact with one added covered with a post-it note (e.g.,  $7 + \square = 9$ ) has been written on the board. The other addend and the answer are numbers close to each other (difference 1, 2, or 3).

Show the same addition fact with triangle cards. *How can you find out what number is hidden?*

If the children suggest the strategy used before, try it together. When subtracting, however, one has to take away many steps, which is slow. When the numbers are close to each other, it is therefore worthwhile using the strategy of adding. It will be introduced next.

*When the numbers you can see are close to each other, it is worthwhile thinking how many you have to add to the number you can see, in order to get to the answer. Lets count the numbers forwards and put up fingers at the same time, to support our memory, until we get to the answer. Let's try: let's first say the starting number seven; eight (put up a finger); nine (put up a finger). How many steps were there from seven to nine? (2, i.e., the fingers put up.)*

Write, e.g., the addition facts listed below on the board. The triangle cards can be used to check the addition fact.

$$\begin{array}{ccc} 6 + x = 9 & 9 + x = 10 & 4 + x = 7 \\ x + 5 = 7 & x + 7 = 10 & x + 8 = 9 \end{array}$$

## WORKING IN PAIRS

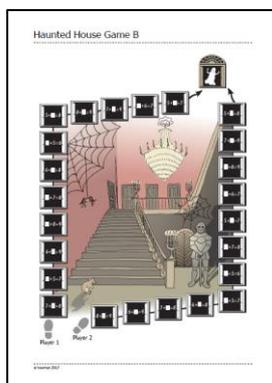
### TASK 1. Haunted House Game

#### AIMS

- solving the missing number in addition, when one addend and the answer are numbers close to each other

#### EQUIPMENT

- counters for the players, two dice (with only 1–3 twice)
- Attachment: Haunted House Game B



## TASK PROCEDURE

The players choose their own route by placing their counter in the start square. In the haunted house, one can only move forward if one can solve subtraction facts correctly and thus open the door to the next room. The player who reaches the happy ghost first is the winner.

The player rolls the two dice. If either count (1, 2, or 3) is the answer to the addition fact in the room the player is in, the player can move on to the next room. They can try to solve the addition fact in this room during their next turn. If the count of neither dice is the answer to the addition fact, the player doesn't move their counter, but tries to get the correct answer during their next turn.

## INDIVIDUAL WORK

### AIMS

- solving the missing number in addition

### EQUIPMENT

- Worksheet: Missing number in addition B

