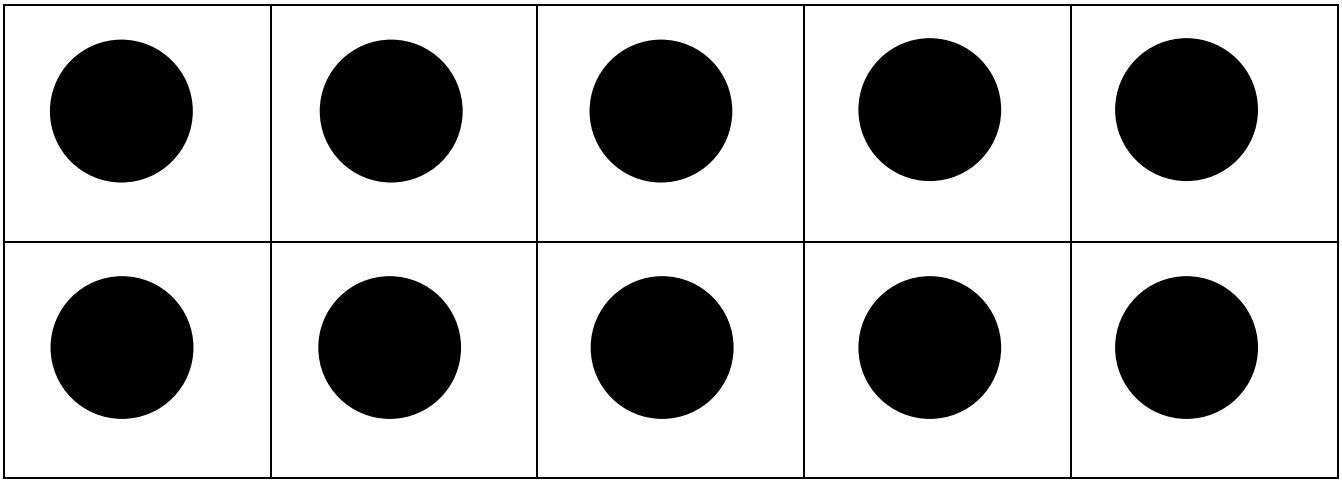
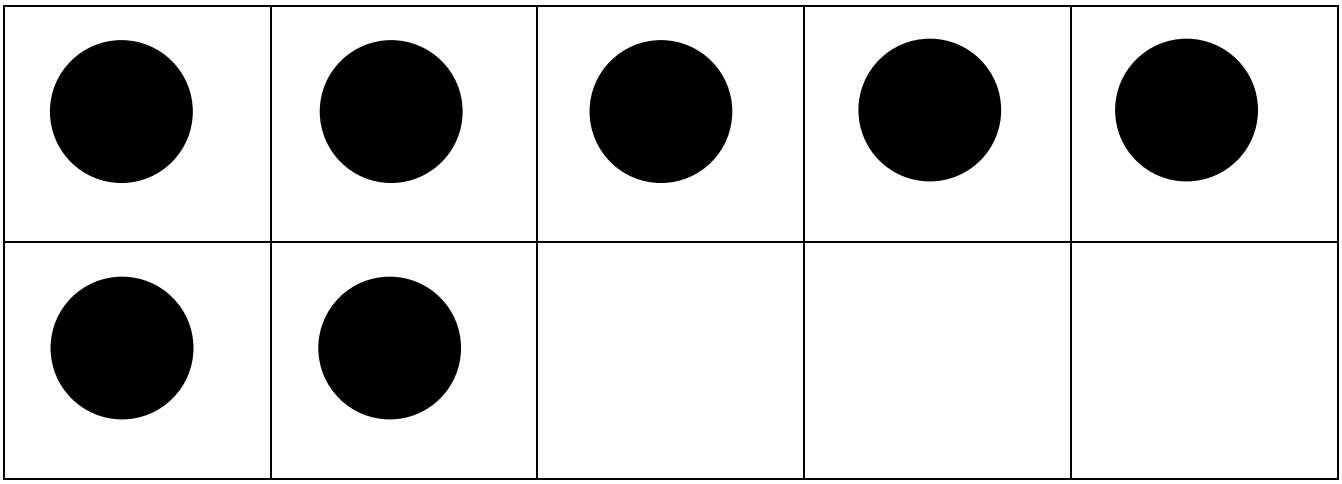
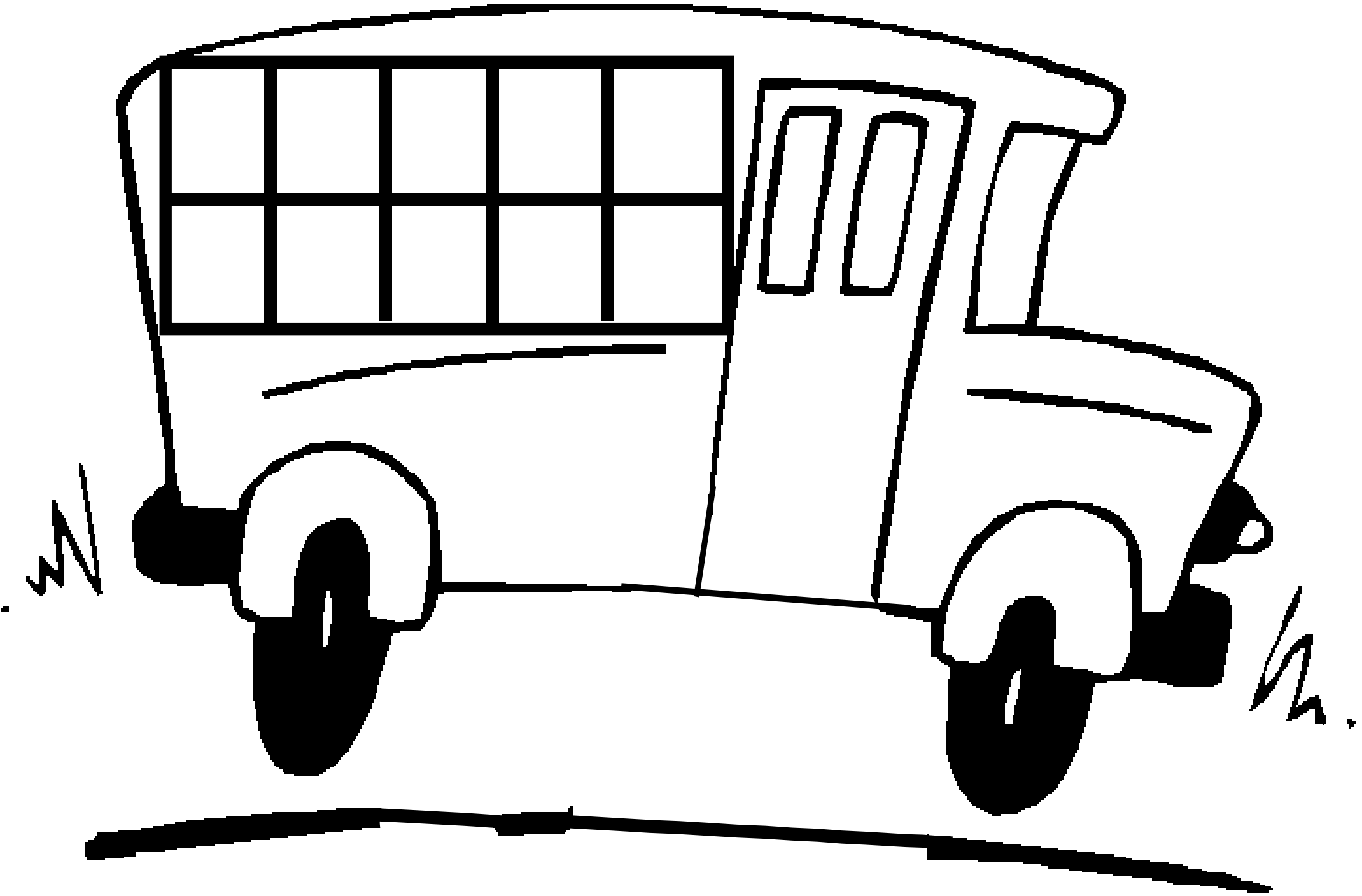
Handout 4

Ten Frames







Ten Frame Activities

Getting to Know Ten Frames

Parent shows the child a ten frame flash card. The child is asked to create the card flashed at them using a small blank card and counters, beans etc. The child discusses the number represented by the card.

"I'm thinking of a number"

The parent says "I'm thinking of a Number" and the child creates that ten frame using their blank frame and counters , beans e.g. 7.
The parent then asks questions such as **"Tell Me** what you would have to do to make your 7 into a 9, a 6 etc."

The Four Questions

Parent flashes a ten frame, then asks the child these four questions for each card.

1. How many dots on top?
2. How many dots on the bottom?
3. How many altogether?
4. How many more to make 10?

Start with the large numbers (6 to 10) as the last questions are too difficult with 2 and 3 etc. The parent can lead the child to the answer to question 4, with these smaller numbers by focussing on the blank spaces rather than the dots, thus linking addition with subtraction.

This activity instils the combinations to 10, and enables children to easily use bridging to 10 when adding.

Ten Frame Bus Activities

Bus Overheads – 10 seats

Using the bus ten frame and clear, coloured counters / beans, the parent models passengers boarding and leaving the bus. Passengers must fill the top from the "back" first and they must leave from the bottom "front". The child practices this as the parent tells a story eg. "Three people got on, then another 4 got on, 2 left etc."

Once the movement of passengers is clear, the real story begins, with questions to determine the passengers on the bus **Before** it is acted out on the child's card.

The child becomes very familiar with sub-base 5 and quickly establishes partitioning facts such as 4 + 3 = 5 + 2 = 7.

Something Happened

This activity also uses the Bus Ten Frame to 10.

The parent gives the child a scenario and the child must devise a story to explain what happened e.g. *"There were 3 children on the bus. Something happens and then there are 5 children. What happened?"*

The child will often begin with the simplest answer, but with encouragement, more complicated multiple events are used.

Longer Stories

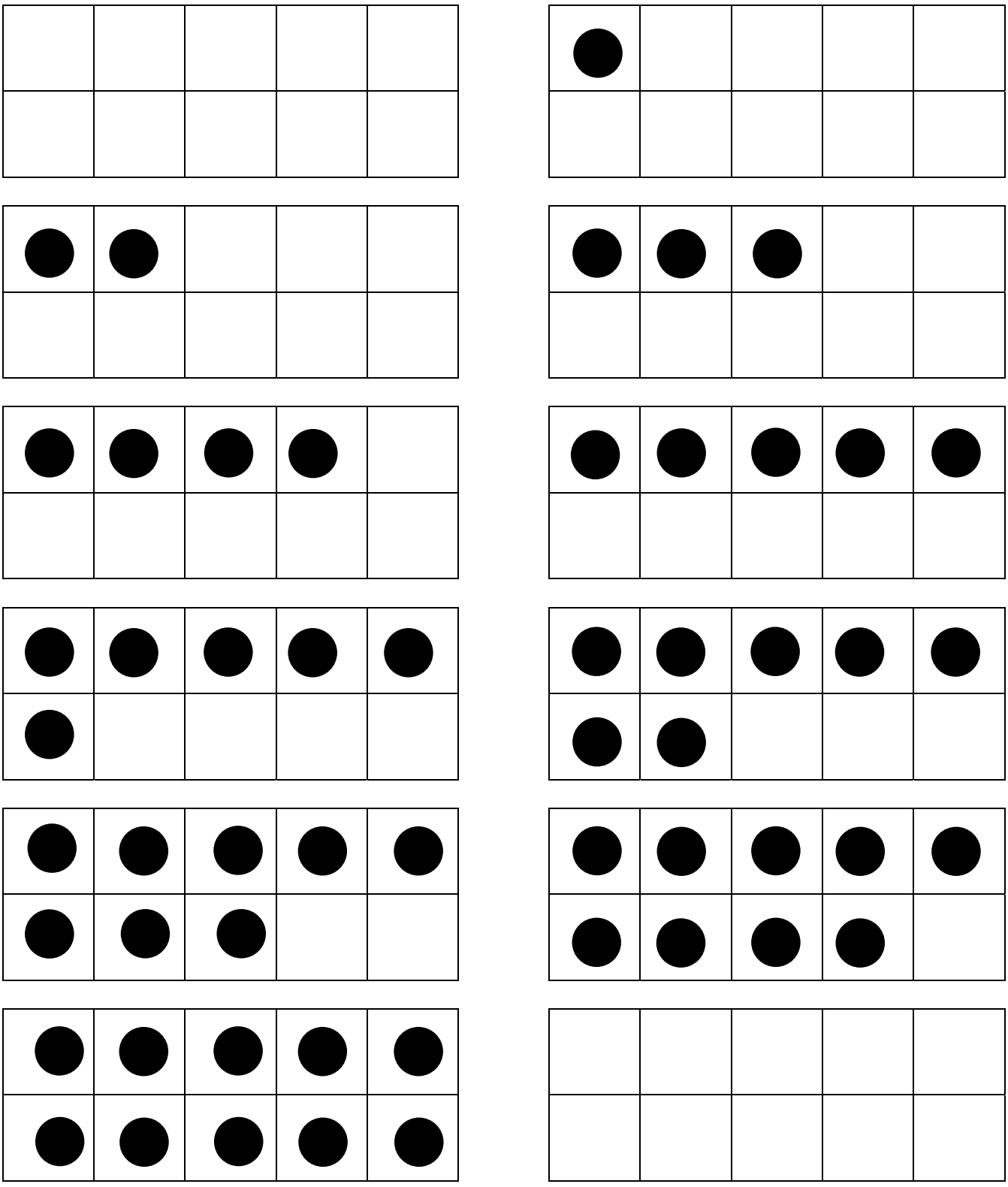
The child creates their own "bus stops" stories with passengers entering and leaving. These are distributed to the parent / older siblings who determine the number of people on the bus at the end of the story. For younger children, these stories could be "written" using diagrams. The writer must determine the answer to their own story and write it beneath the flap or conceal it on the back.

20 Passenger Bus

This activity repeats the earlier ones, but develops bridging the ten barrier using partitioning. Excellent for moving forward (addition) and backward (subtraction) in the teens and across ten. Once bridging ten is understood, bridging 20, 10 etc. is easier.

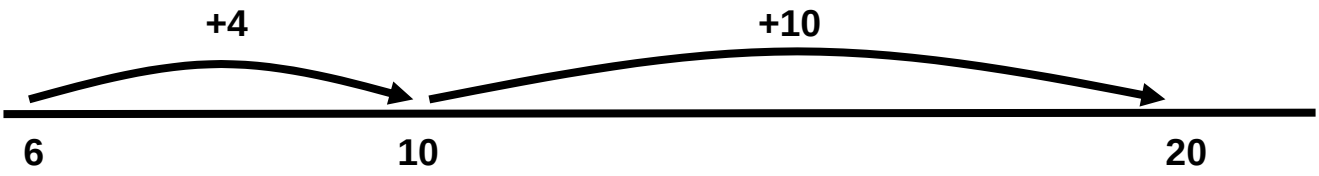
Handout 8

Ten Frames



Mental Strategies for Addition and Subtraction

6 + 14 = 20

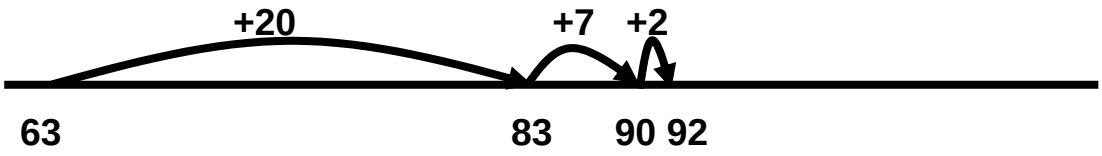


6 + 4 = 10, 10 + 10 = 20

First I added 4 to the 6 to get 10, then I added another 10 and got 20.

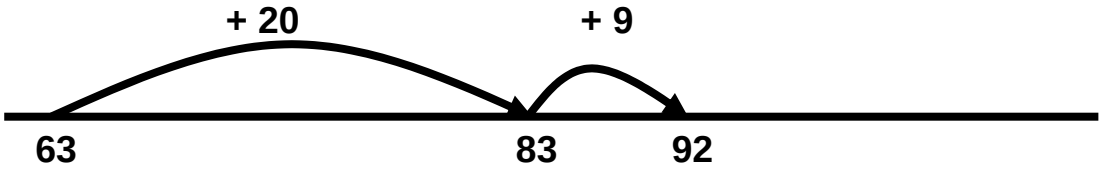
63 + 29 =

Jump



63 + 20 = 83, 83 + 7 = 90, 90 + 2 = 92

I kept the 83 whole and split the 29 into 20 and 9. Then I added 20 to 63 and got 83. Then I added 7 because 3 and 7 make a ten and got 90. Then I added the other 2 and got 92.

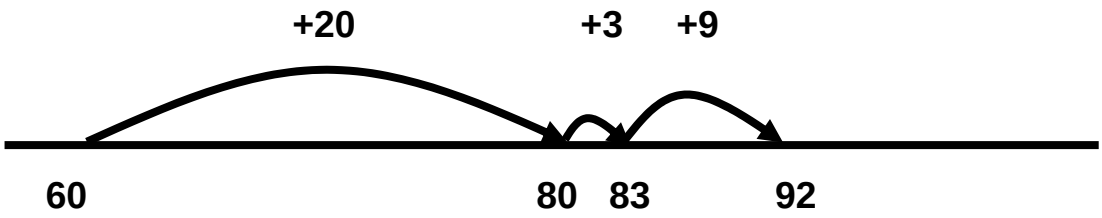


63 + 20 = 83, 83 + 9 = 92

I kept the 83 whole and broke the 29 into 20 and 9. Then I added 20 to 63 and got 83. Then I added the 9 and got 92.

63 + 29 =

Split



60 + 20 = 80, 3 + 9 = 12, 80 + 12 = 92

I broke the 63 into 60 and 3, and the 29 into 20 and 9. Then I added the 60 and the 20 and got 80. Then I added the 3 and the 9 and got 12. Then I added the 80 and the 12 and got 92.

Compensation

63 + 30 = 93, 93 – 1 = 92

First I added 30 to 63 because 29 is nearly 30 and it's easier to add tens. I got 93. Then I had to take one away because 30 is one more than 29 and I got 92.

The Algorithm

$$\begin{array}{r} {}^{1}63 \\ +\ 29 \\ \hline 92 \\ \hline \end{array}$$

We say:

3 plus 9 equals 12, write down the 2 and add one 10.

6 plus 2 equals 8, plus the 1 equals 9.

When solving an algorithm, we treat each digit as a ‘one’, even the ‘tens’!

A reliance on the algorithm limits children’s conceptual understanding of place value.

Practising Mental Strategies for subtraction:

52 – 18 =

Number Line:

Numbers:

Words:

Number Line:

Numbers:

Words:

Algorithm Strategies: Equal Addends

$$\begin{array}{r} 5^{1}2 \\ -\ {}^{1}1\ 8 \\ \hline 3\ 4 \\ \hline \end{array}$$

We say:
2 minus 8 you can't do so we add a ten to the ones column in the top number and a ten to the tens column in the bottom number.

Now my 2 is 12. 12 minus 8 you can do. It leaves 4. Write down the 4.

5 minus 2 equals 3. Write down the 3.

Algorithm Strategies: Decomposition

$$\begin{array}{r} {}^{4}\not{5}^{1}2 \\ -\ 1\ 8 \\ \hline 3\ 4 \\ \hline \end{array}$$

We say:

2 minus 8 you can't do so we get a ten from the tens column. Now my 2 is 12. 12 minus 8 you can do. It leaves 4. Write down the 4.

4 minus 1 equals 3. Write down the 3.

Algorithm Strategies: Decomposition with Zeros

$$\begin{array}{r} {}^{7}\not{8}^{9}\not{0}^{9}\not{0}^{1}0 \\ -\quad 6\,7\,3 \\ \hline 7\,3\,2\,7 \\ \hline \end{array}$$

We say:

We say:
0 minus 3 you can't do.
So I need to get a ten from the tens column but there aren't any.
So I need to get a hundred from the hundreds column to give to the tens column but there aren't any.
So I can get a thousand from the thousands column to give to the hundreds column.
That leaves 7 in thousands column and 10 in the hundreds column.
I give one hundred to the tens column.
That leaves 9 in the hundreds column and 10 in the tens column.
NOW I can give a ten from the tens column to the ones column.
10-3=7,
9-7=2,
9-6=3,
7-0=7
Oh forget it! Let's just use the compensation strategy …….

Change the 8000 into 7999 + 1.

$$\begin{array}{r} 7\,9\,9\,9 \\ -\quad 6\,7\,3 \\ \hline 7\,3\,2\,6 \\ \hline \end{array}$$

7326 + 1 = 7327

A Number Activity for Children Working Towards Early Stage One Outcomes

Outcome: Counts to 30, and orders, reads and represents numbers in the range 0 to 20

Number Lines

Equipment:
Set of numeral cards 0 to 20
Number Line 0 to 10
Paper Clip / Bobby Pin
Piece of string

Instructions
Parents give their child a number in the given range (e.g. 10 to 20). The child has to place their number on a string hung across the room or on the floor.
The child explains the placement of the numbers.
The child selects a second number to place on the string considering its placement in relation to the first number.
This is repeated with each number, discussing where each number should go, before placement.
e.g.

Possible questions to ask your child:

- What numbers comes before / after 17?
- What numbers go between 14 and 17?
- Where do you think 11 will go?

Comments when played at home:

A Number Activity for Children Working Towards Stage One Outcomes

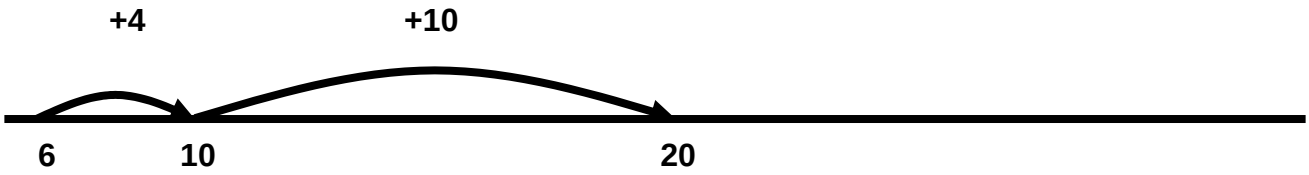
Outcome: Uses a range of mental strategies and informal recording methods for addition and subtraction involving one- and two-digit numbers

Flip 1 and Add to 20
Flip 1 and Subtract from 20

Equipment:
Pencil and paper
Deck of Playing Cards (remove Kings, Jokers, Queens, Jacks and tens cards)
Ace = Represents the number 1

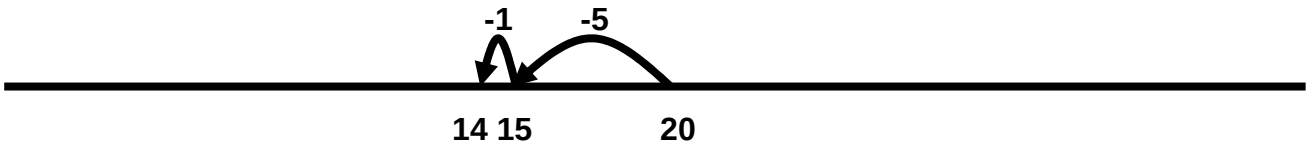
Instructions:
The child is given a pack of cards. The child flips a card to make a one-digit number e.g. 6. Students are then asked to work out 6 + ___ = 20 recording their mental strategies on an empty number line, using numbers and using words. They are encouraged to use a range of mental strategies such as the jump strategy, split strategy and compensation strategy. For example:

Addition:
6 + 14 = 20



6 + 4 = 10, 10 + 10 = 20
First I added 4 to the 6 to get 10, then I added another 10 and got 20.

Subtraction:
20 – 6 = 14



20 – 5 = 15, 15 – 1 = 14
First I took 5 away from 20 and got 15 because I know 20 – 5 = 15. Then I took away the other 1 from 15 and got 14.

Comments when played at home:

A Number Activity for Children Working Towards Stage Two and Stage Three Outcomes

Outcome: Uses mental and written strategies for addition and subtraction involving two-, three- and four-digit numbers and numbers of any size.

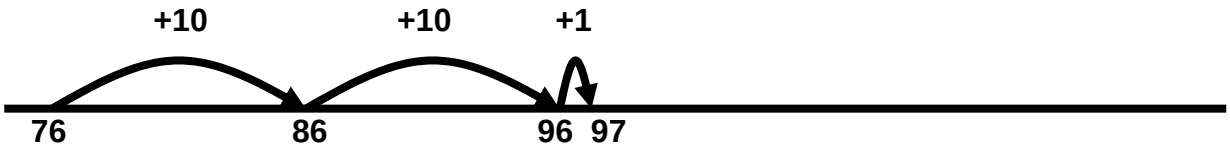
Flip 4, make and add two 2-digit numbers without going over 100

Equipment:
Pencil and paper
Deck of Playing Cards (remove Kings, Jokers, Queens, Jacks and tens cards)
Ace = Represents the number 1

Instructions:
The child is given a pack of cards. The child flips 4 cards. The child is then asked make 2 two-digit numbers that, when added together, will total less than but close to 100. They record their mental strategies on an empty number line, using numbers and using words. They are encouraged to use a range of mental strategies such as the jump strategy, split strategy and the compensation strategy. For example:

The child flips 1, 7, 2 and 6
The child makes 76 and 21 as they will total less than but close to 100.

76 + 21 = 97



Flip 6, make and add two 3-digit numbers without going over 1000

This can be extended to three-digit numbers. The child flips 6 cards. The child is then asked make 2 three-digit numbers that, when added together, will total less than but close to 1000. For example:

The child flips 1, 7, 3, 2, 2 and 6
The child makes 371 and 622 as they will total less than but close to 1000.

371 + 622 = 993

622 + 300 = 922, 922 + 70 = 992, 992 + 1 = 993
First I added 300 to 622 and got 922. Then I added the 70 and 992. Then I added 1 and got 993.

Flip 8, make and add two 4-digit numbers without going over 10 000

Comments when played at home:
