

# BASIC FACTS: ADDITION AND SUBTRACTION MILESTONES

## Foundation

**Yr F ACMNA001:** Establish understanding of the language and processes of **counting by naming numbers in sequences**, initially to and from 20, moving *from any starting point*

### Ability to Identify the Larger Number

Links may be made to moves along a track. A roll of 4 moves further than a roll of 3.



Materials such as dominoes and cubes may be used to model this.



### Counting Principles

Five Principles

How to Count:

1. Know the number names in order.
2. One to one matching.
3. The last name spoken in the count represents the total of the set (cardinality).

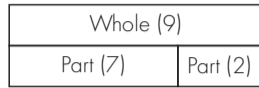
What to Count:

4. Order irrelevance: the count can start anywhere.
5. Abstraction: children will at first only count objects that are similar. Later they will count collections of different objects and later still, unseen objects.

## Year 1

**Yr 1 ACMNA015:** Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts.

Explore links between addition and subtraction.



Make use of the commutative property to apply the Count on from the Larger Number strategy e.g.  $7 + 2$  is the same as  $2 + 7$ .

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

**Year 1 Strategies and Understandings: New Facts to Learn**

### Addition Strategy 1

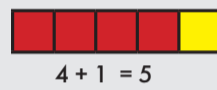
#### COUNT ON FROM THE LARGER NUMBER

Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts.

Count on:

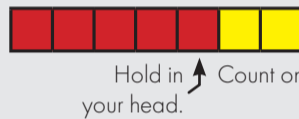
By 1: **Facts To Learn:**  $1+1, 2+1, 3+1, 4+1, 5+1, 6+1, 7+1, 8+1, 9+1$

Join Cubes to form the larger number. Add (join) a cube of a different colour. Hold the stick at the point where the two colours join. Count on.



By 2: **Facts to Learn:**  $2+2, 3+2, 4+2, 5+2, 6+2, 7+2, 8+2, 9+2$

Hold a number in your head and count on.  
e.g.  $5 + 2$ .



By 3: **Facts to Learn:**  $3+3, 4+3, 5+3, 6+3, 7+3, 8+3, 9+3$

By 0: **Facts to Learn:**  $1+0, 2+0, 3+0, 4+0, 5+0, 6+0, 7+0, 8+0^*, 9+0$

This is really the Addition Property of Zero, that is, the sum of any number and zero is that number. Ensure that students understand this pattern.

### Understanding 2

#### ADDITION PROPERTY OF ZERO

**Facts to Learn:** See 'Count on from the Larger Number: By 0'

The Addition Property of Zero states that a number will not change when 0 is added to it (see the green shaded numbers in the above addition grid). Essentially this is using the strategy 'Count on from the Larger Number, by 0.'

### Understanding 1

#### COMMUTATIVE PROPERTY

**Facts to Learn:** Once a fact is learned, the turn around fact should be known too.

Numbers may be added in any order without affecting the result (sum) e.g.  $4 + 1 = 1 + 4$ . This means that if you learn one fact you get one free. In effect you are rearranging parts.

Teaching Tools:

- Use cubes in two colours.
- Turn around.



### Subtraction Strategy 1

#### COUNT BACK (SUBTRACTION) BY 1, 2, 3 OR 0

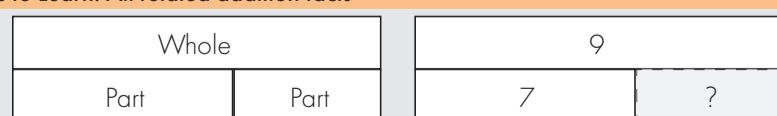
**Facts to Learn:** Related to count on by 1, 2 and 3: e.g.  $1-1, 2-1, 3-1...$

Counting back is similar to counting forward by 1,2,3,0. Some students experience difficulty counting back across the decade. Begin counting back one.

### Subtraction Strategy 2

#### SEE SUBTRACTION, THINK ADDITION

**Facts to Learn:** All related addition facts

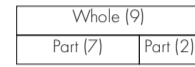


## Year 2

**Yr 2 ACMNA030:** Solve simple addition and subtraction problems using a range of efficient mental ... strategies.

**Yr 2 ACMNA029:** Explore the connection between addition and subtraction.

**Fact Families:** Link addition and subtraction facts: learn one fact get 5 free. For example:



$7 + 2 = 9$  |  $7 + \square = 9$  |  $9 - 2 = \square$   
 $2 + 7 = 9$  |  $\square + 2 = 9$  |  $9 - 7 = \square$

Review all Count on from the Larger Number facts.

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
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**Year 2 Strategies: New Facts to Learn**

### Addition Strategy 2

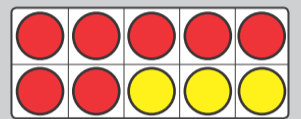
#### BUILD TO TEN

**Facts to Learn:**  $9+1, 8+2, 7+3, 6+4, 5+5, 1+9, 2+8, 3+7, 4+6$

This strategy accounts for 3 new facts ( $6 + 4, 5 + 5, 4 + 6$ ) and revision of 6 facts.

Teaching Tools:

- Ten frames are an ideal tool for teaching the 'ten facts'.



### Addition Strategy 3

#### DOUBLES

**Facts to Learn:**  $0+0, 1+1, 2+2, 3+3, 4+4, 5+5, 6+6, 7+7, 8+8, 9+9$

This strategy accounts for 5 new facts ( $4 + 4, 5 + 5, 6 + 6, 7 + 7, 8 + 8, 9 + 9$ ) and revision of four facts ( $0 + 0, 1 + 1, 2 + 2, 3 + 3$ ). The associated subtraction facts for the doubles equal zero, e.g.  $4 - 4 = 0$ .

Teaching Tools:

- Cubes in two colours may be used to model this strategy.



### Addition Strategy 4

#### NEAR DOUBLES

**Prerequisite:** Knowledge of doubles facts

**Facts to Learn:**  $1+0, 2+1, 3+2, 4+3, 5+4, 6+5, 7+6, 8+7, 9+8$

Students will need to know their doubles facts and then make an adjustment to the calculation and compensate for it. For example  $6 + 7$  is  $6 + 6$  and one more or  $7 + 7$  take one. The associated subtraction facts all have a difference of one, e.g.  $5 - 4 = 1$ .

Teaching Tools:

- Cubes in two colours.



### Addition Strategy 5

#### BRIDGE TEN

**Prerequisite:** Build to ten facts, partitioning

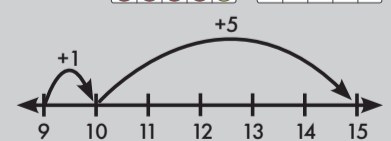
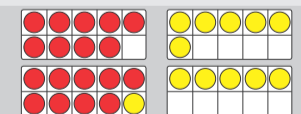
**Facts to Learn:**  $7+4, 8+4, 9+4, 7+5, 8+5, 9+5, 8+6, 9+6, 9+7$

This strategy accounts for 9 new facts. Commutatively there are 9 more facts ( $7+4, 7+5, 8+4, 8+5, 8+6, 9+4, 9+5, 9+6, 9+7$ ). The  $9+$  facts can be tackled first then the  $8+$  facts and so on.

Teaching Tools:

- Ten Frames
- Number Line

Example:  $9 + 6 = 10 + 5$



## Leads to Year 3

**Yr 3 ACMNA055:** Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation.

**Yr 3 ACMNA054:** Recognise and explain the connection between addition and subtraction. Link via part part whole thinking.

