

# **Auchinloch Primary School & Nursery Class**



## **Number Talks Procedure**

# Number Talks – Resource Overview

Please find below a simplified overview of how to use the Number Talks resource for Mental Agility

*Number Talks* is a resource designed to support and facilitate daily ‘**Mental Agility**’ sessions within primary school numeracy lessons.

“*Mental Agility is the ability to carry out multi-step mental questions accurately*”.

*Number Talks* outlines the range of mental strategies for solving number-based problems for all 4 number operations (addition, subtraction, multiplication and division). Throughout *Mental Agility* sessions, the teacher will directly teach the range of strategies for their stage, engaging the children in a variety of active experiences that familiarise the children with the process of each mental strategy.

“*The problems in a number talk are designed to elicit specific strategies that focus on number relationships and number theory. Students are given problems in either a whole class or small-group setting and are expected to mentally to solve them accurately, efficiently and flexibly.*” (Parrish, Sarah. 2014 Number Talks)

The resource specifically highlights the significance of a purposeful conversation based around number problems that are to be solved mentally. The children are encouraged to select (from the variety of strategies taught by the teacher) the most effective strategy for mentally calculating the number problem posed and articulate clearly the process they went through to determine the answer.

“*By sharing and defending their solutions and strategies, students have the opportunity to collectively reason about numbers while building connections to key conceptual ideas in mathematics.*” (Parrish, Sarah. 2014 Number Talks)

The idea is that, regardless of the lesson’s focus, the children would begin every maths lesson with a number-based mental agility session. When *Mental Agility* using *Number Talks* is first being implemented, these sessions may take up to 40+ minutes, however as this becomes more embedded, “*A typical classroom number talk can be conducted in five to fifteen minutes*” depending on the problem, strategy being taught, stage etc.

## Where to begin?

The resource is based on American Education grading. Below is a table clearly outlining the grade that represents Scottish Primary levels.

### Converting American Grades to CfE Levels:

American Education	Scottish Education
Kindergarten	Primary 1 Primary 2
Grade 1	Primary 3
Grade 2	Primary 4
Grade 3	Primary 5
Grade 4	Primary 6
Grade 5	Primary 7

## Strategies

As mentioned above, each stage are taught varying strategies. Below is a table that outlines which strategies should be taught at each stage.

Category	Strategy/Tool	K	1	2	3	4	5	Page Number
Addition	Counting All/Counting On	•	•	•				46, 50, 59, 60, 121
	Doubles/Near-Doubles	•	•	•	•	•	•	51, 60, 172, 341, 343
	Making Tens	•	•	•	•	•	•	51, 61, 172, 341, 343, 344
	Making Landmark or Friendly Numbers	•	•	•	•	•	•	22, 46, 62, 171, 346
	Breaking Each Number into Its Place Value	•	•	•	•	•	•	23, 51, 63, 164, 171, 343, 344, 346
	Compensation	•	•	•	•	•	•	23, 62, 165, 173, 342
	Adding Up in Chunks	•	•	•	•	•	•	47, 64, 164, 173, 344, 345

These tables can  
book be found on p.xxix  
and p.xxx in the  
Number Talks

Category	Strategy/Tool	K	1	2	3	4	5	Page Number
Subtraction	Adding Up		•	•	•	•	•	48, 54, 55, 65, 166, 167, 175, 349, 350, 367
	Removal or Counting Back		•	•	•	•	•	47, 55, 66, 176, 206, 349, 350, 367
	Place Value and Negative Numbers			•	•	•	•	177
	Adjusting One Number to Create an Easier Problem				•	•	•	167, 179, 349
	Keeping a Constant Difference				•	•	•	178, 348, 350
Multiplication	Repeated Addition or Skip Counting				•	•	•	238, 239, 242, 245, 265, 351, 352, 353
	Making Landmark or Friendly Numbers				•	•	•	242, 247, 360, 362
	Partial Products				•	•	•	242, 248, 352, 353, 354, 359, 361
	Doubling and Halving				•	•	•	250, 361, 362
	Breaking Factors into Smaller Factors				•	•	•	252, 362
Division	Repeated Subtraction or Sharing/Dealing Out				•	•	•	254, 255, 256, 257, 287
	Partial Quotients				•	•	•	258
	Multiplying Up				•	•	•	258, 293
	Proportional Reasoning				•	•	•	259

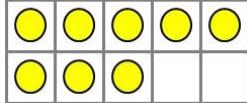
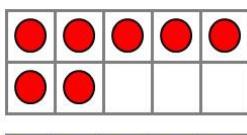
Strategies taught  
in each stage are  
highlighted with a  
dot ●

# Mental Agility Methodology

Mental Agility can take a variety of forms. As we know children learn differently, some are visual learners; others learn kinaesthetically. The aim of Mental Agility sessions is to provide the children with an array of mental strategies that they can choose from. These strategies are further explained in the Number Talks book and can be arranged under the following headings:

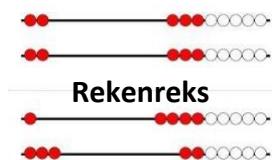
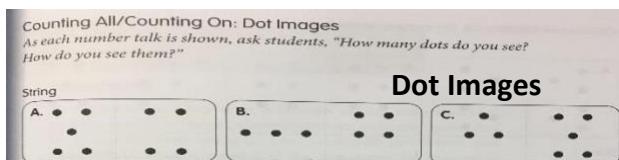
## Hands On

Counters, cubes, coins, some practical experience to draw upon, manipulate materials to allow exploration, being able “to see” the problem



## Visualisation Jottings

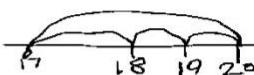
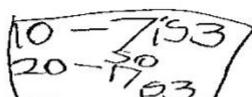
Dot images, Ten-Frames, Rekenreks etc - Developed through practical experience and practise.



## Ten-Frames

Informal notes, use of models and diagrams, white boards, jottings jotter.

*There are 20 children in our class. Three are away today. How many are here?*



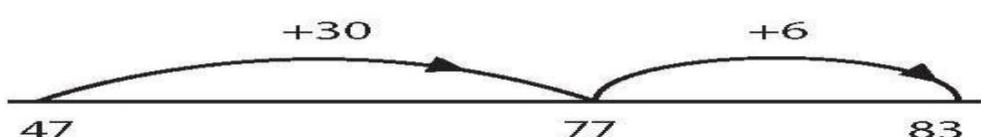
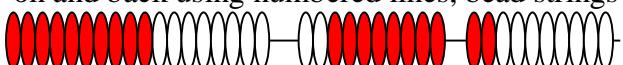
2 away would be 18  
So 3 away must  
be 17.

$20 - 3 = 17$

## Empty Number Lines

Modelling calculations, developing understanding, develop an image of a number in their head.

Before children can begin to use an empty number line, they need to have had lots of experience of counting on and back using numbered lines, bead strings and partly numbered lines.



# Mathematics lesson Structure Guide

## Monday – Thursday Mathematic Planning

Approx. Time	Activity	Suggested Resources
5min	Learning Intentions Displayed and Discussed	
10min	Mental Maths	Mental maths books Mental maths planners Have a go boards markers Number fans Clock faces Songs, Rhymes, Raps Flashcards
15mins	Number Talks Mental Agility	Number Talks Book Strategy Posters Displayed SmartBoard, Whiteboard, Hands-On resources, Jottings Jotter, Empty Numer Lines, DreamBox Website has interactive mental agility strategies (*see link below)
15min	Revisit Learning Intention  Prior Learning  Direct teaching – whole class	Heinemann Teaching book
15min	Practical Activities – Differentiation	Active Maths
15min	Recording activities - Differentiation	Heinemann  T J
Fast Finishers	Extension Tasks Available	Extension books  Maths cards
15min	Plenary  Teacher/peer/self assessment  To include what we have learned  What we will be learning  Discuss Homework  Can be taken outside should vary throughout the week	Word Problem,  Use of Formative Assessment techniques,  Blooms-style Questioning,  Plenary Dice

\*DreamBox website link - <http://www.dreambox.com/teachertools>

## Friday Mathematic Planning

Approx. Time	Activity	Suggested Resources
5min	Learning Intentions Displayed and Discussed	
15min	Mental Maths tests 2 groups Tables test	Recorded at the Back of jotters
15mins	Number Talks Mental Agility	Number Talks Book
10min	Problem Solving Teaching skills – RACE CAR	RACE CAR Display PP
15min	Problem Solving/ Word problems – training for holistic assessments	Problem Solving disks Holistic assessments
Fast Finishers	Extension Tasks Available	Extention books Maths cards
15min	Plenary Teacher/peer/self assessment To include what we have learned What we will be learning Discuss Homework Can be taken outside should vary throughout the week	

N.B ICT must be include at some stage in the lesson.

**Formative Feedback should be evident throughout and in assessments using 2 star and a wish**