**What is Number Talks?**

Number Talks is a resource designed to help and support *Mental Agility*.

*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 four number operations (addition, subtraction, multiplication and division). Throughout Number Talks 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 strategies.

The resource specifically highlights the significance of 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.

The idea is, that regardless of the Maths lesson focus, the children begin every maths lesson with a number-based mental agility session. When Mental Agility using Number Talks is first implemented it may take up to 40 minutes, however as this becomes more embedded, a typical number talk can be conducted in fifteen minutes.

**Key Features of Number Talks**

* It is a conversation that takes place around a numeracy problem that the children should solve mentally
* The problems allow children to build on previous knowledge and use specific strategies
* Pupils are given a problem that they are expected to mentally solve, accurately and efficiently
* Pupils share how they have solved the problem, and what strategies they have used
* 15 minutes daily at the beginning of every Numeracy lesson

**Benefits of Number Talks**

Through participating in Number Talks, the pupils have the opportunity to:

* Explain their own thinking
* Consider other strategies suggested by their peers
* Learn about a range of efficient strategies
* Make decisions about choosing the best strategy for specific problems.

**Grades and Stages**

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| **Number Talks** | **Scottish Education** |
|  |  |
| **Kindergarden** | **Nursery & Primary 1**  |
| **Grade 1** | **Primary 2 and 3** |
| **Grade 2** | **Primary 4** |
| **Grade 3** | **Primary 5** |
| **Grade 4** | **Primary 6** |
| **Grade 5** | **Primary 7** |

**Strategies**

Each stage is taught varying strategies. Below is a table that outlines which strategies should be taught at each stage. This information is also on pages xxix and xxx in the Number Talks book.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 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 |
| **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 & 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 Friendly Numbers  |  |  |  |  |  |  | 242, 247, 360, 362 |
| Partial Products |  |  |  |  |  |  | 242, 248, 352, 353, 354, 359, 361 |
| Doubling & Halving |  |  |  |  |  |  | 250, 361, 362 |
| Breaking Factors into Smaller Factors |  |  |  |  |  |  | 252, 362 |
| **Division** | Repeated Subtraction |  |  |  |  |  |  | 254, 255, 256, 257, 287 |
| Partial Quotients |  |  |  |  |  |  | 258 |
| Multiplying Up |  |  |  |  |  |  | 258, 293 |
| Proportional Reasoning |  |  |  |  |  |  | 259 |

**Mental Agility Methodology**

Mental Agility can take a variety of forms. As we know, children learn differently, some are visual learners etc. The aim of Number Talks is to provide children with an array of mental strategies that they can choose from. These strategies are further explained in the Number Talks book.

**Hands On**

Counters, cubes, coins, some practical experience to draw upon. This allows the child to see the problem.

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**Visualisation**

Dot images, ten frames etc.

**Jottings**

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

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**Empty Number Lines**

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

**Mental Agility Methodology**

**Example of a Maths Lesson Structure**

The following must be followed;

An example illustrates how Number Talks should be incorporated throughout every Maths lesson.

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| --- | --- | --- |
| **Approximate Time** | **Activity** | **Suggested Resources** |
| 15 minutes | **Mental Maths**(Fun, active way to check recall of numeracy facts) |  |
| 15 minutes | **Number Talks**The children explore a range of strategies and talk about them – classroom conversations. The focus is then on a particular strategy – this should relate to the concept being taught. E.g. If you are teaching addition then the focus on addition strategies within Number Talks) | Number Talks bookJottings JotterTen FramesRekenreksDotsEmpty Number Lines100 SquareWhiteboards |
| 5 minutes | Learning Intention and Success Criteria discussed and on display.When pupils are ready they should be involved in creating the Success Criteria |  |
| 30/ 40 minutes | **Main Section of Lesson**Direct teaching of differentiated groupings. We advocate SEAL (P1-P4) and Developing Number Knowledge (P5-P7) methodology for this. Teaching is then further supported/ extended by an activity and a written task.**Group 1 Group 2 Group 3**DT (T) Activity/ Game/ ICT Written TaskWritten Task DT (T) Activity/ Game/ ICTActivity/ Game/ ICT Written Task DT (T)   | SEAL and Developing Number Knowledge Planners &/ resourcesHeinemann Active MathsTeejay |
| 10 minutes | **Plenary**Teacher/ self/ peer assessmentRevisit of Learning Intention and Success Criteria | AiFL StrategiesBlooms questioning |

**Number Talks Planner**

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| --- | --- | --- | --- |
| **Stage/ Level** | **Experiences and Outcomes** | **Number Talks Strategy** | **Number Talks Book – page number** |
| **Nursery and Primary 1**KindergardenEarly and First Level | MNU 0-02aMNU 0-03aMNU 0-07aMNU 1-01a | **Addition**Counting all/ counting onFluency with 3Fluency with 4Fluency with 5Fluency with 6Fluency with 7Fluency with 8Fluency with 9Fluency with 10 | 46 & 5071, 90 & 8371, 90 & 8373, 91 & 8474, 92 & 8476, 93 & 8677, 94 & 8678, 95 & 8780, 96 & 88 |
| **Primary 2 and Primary 3**Grade 1First Level | MNU 1-01aMNU 1-02aMNU 1-03aMTH 1-15a | **Addition**Counting all/ counting onDoubles/ Near DoublesMaking TensMaking Friendly NumbersBreaking each Number into its Place ValueCompensationAdding up in Chunks**Subtraction**Adding upRemoval or Counting backFluency with 6Fluency with 7Fluency with 8Fluency with 9Fluency with 10 | 98, 103, 101 & 106109, 107 & 111114, 112 & 11711813323 & 6247 & 6448 & 5447 & 5574, 92 & 8476, 93 & 8677, 94 & 8678, 95 & 8780, 96 & 88 |
| **Primary 4**Grade 2First Level | MNU 1-01aMNU 1-02aMNU 1-03aMTH 1-15a | **Addition**Counting all/ counting onDoubles/ Near DoublesMaking TensMaking Friendly NumbersBreaking each Number into its Place ValueCompensationAdding up in Chunks**Subtraction**Adding upRemoval or Counting backPlace Value and Negative NumbersFluency with 10 | 59, 60 & 121 122, 123 &124125 – 128129 – 128133 – 136137 – 140141 – 144147 – 149152 – 154177 80, 96 & 88 |
| **Primary 5 – Primary 7**Grade 3 – 5Second Level | MNU 2-01aMNU 2-02aMNU 2-03aMNU 2-03cMNU 2-04aMNU 2-07aMNU 2-07bMTH 2-07cMTH 2-05a | **Addition**Making TensMaking Friendly NumbersDoubles/ Near DoublesBreaking each Number into its Place ValueAdding up in Chunks**Subtraction**Adding upRemoval or Counting backPlace Value and Negative NumbersAdjusting One Number to Create an Easier ProblemKeeping a Constant Difference**Multiplication**Repeated Addition Making Friendly NumbersPartial ProductsDoubling and HalvingBreaking Factors into Smaller Factors**Division**Repeated SubtractionPartial Quotients Multiplying upProportional Reasoning | 185- 188189 – 192193 – 196197 – 200201 – 204209 – 211212 – 216217 – 220221 – 225227 – 229265 – 266267 – 271272 – 275276 – 281282 – 285287288 – 292293 – 297299 |

**Number Talks Planner**

|  |  |  |  |
| --- | --- | --- | --- |
| **Stage/ Level** | **Experiences and Outcomes** | **Number Talks Strategy** | **Number Talks Book – page number** |
| **Primary 5 – Primary 7** Grade 3 – 5Second Level  | MNU 2-01aMNU 2-02aMNU 2-03aMNU 2-03bMTH 2-03cMNU 2-07aMNU 2-07bMTH 2-07c | **Fractional Reasoning** Equal Parts of a FractionEquivalent FractionsFractional Reasoning Using Set Models **Ordering Fractions**Integers as Benchmarks Integers and Fractions as Benchmarks Closer to 0, 1/2 ,1 Closer to 1, 1 ½ , 2Distance from the Whole & Proximity to ½ Common Numerators **Multiplication with Whole Numbers and Fractions** Multiplying Whole Numbers by Fractions Doubling and Halving Decomposing **Division with Whole Numbers and Fractions** Whole Number Divisors Using Unit Fractions as Divisors Multiplying Up**Linking Fractions and Percentages** Use Benchmark Percentages as FractionsFind Percentages of Whole Numbers Compare Decimals to Decimals **Addition with Decimals** Place Value Adding Up in Chunks Benchmark Numbers **Subtraction with Decimals** Adding Up Adjusting One NumberKeeping a Constant Difference Place Value **Multiplication with Decimals** Ten Times Larger/SmallerPartial Products  | 7786, 9089959797101103106, 108109237, 240 267260292, 294296313121123129338342347, 348352356, 357360, 361365370, 372376 |