# MATHS WORKSHOP – TUESDAY, NOVEMBER 1st 2016
## MULTIPLICATION & DIVISION - AGENDA

## Early Stage One – groups, shares, counts objects → everyday language, informal recording

| Early Stage One – concrete experiences of grouping, sharing and counting<br>    – group to describe a collection of objects<br>    – sharing to describe distribution of objects | |
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| Activity | Resource |
| **1. Faces Activity**<br>My 2 friends have 2 lollies each. How many do they have altogether? →count by ones initially, leads onto skip counting →same size sharing<br>**2. Reverse Faces Activity**<br>I have 9 lollies to share with 3 friends. How many do they each get? →once shared, they count – notion of equal groups/equal sharing | • Faces template<br>• Counters |

## Stage One – using concrete materials and mental strategies for multiplication and division

| Stage One – Initially skip counting, language of "groups of", equal sharing<br>    – Moves into Multiplication strategies (repeated addition, groups and arrays)<br>    – Moves into Division strategies (shared groups turn into arrays)<br>*Background Information: There are two forms of division:*<br>*Sharing (partitive) – How many in each group?*<br>*e.g. 'If 12 marbles are shared between three students, how many does each get?'*<br>*Grouping (quotitive) – How many groups are there?*<br>*e.g. 'If I have 12 marbles and each child is to get four, how many children will get marbles?' This form of division relates to repeated subtraction, 12 – 4 – 4 – 4 = 0, so three children will get four marbles each.* | |
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| Activity | Resource |
| **1. Plate Activity (Multiplication)**<br>I have 5 strawberries on each of my 3 plates? How many strawberries altogether? → want students to describe as 5 groups of 3 is 15<br>**2. Plate Activity (Division)**<br>If 10 strawberries are shared between 2 people, how many in each group? (SHARING Division)<br>I have 20 strawberries. How many groups will I have if shared equally between 4? (GROUPING Division)<br>**3. Number Lines Activity (Multiplication)**<br>What are 3 groups of 4? Same a 4+4+4 <br>**4. Turn Groups Into Arrays (Multiplication)**<br>What are 2 groups of 3? Becomes→ <br>**5. Turn Groups Into Arrays (Division)**<br>How many does each person receive when 10 objects are shared between two people? <br>**6. Repeated Subtraction (Division)**<br>Share 15 stickers between 3 people. <br>Share $24 between 6 people. <br>-start to explore "left overs" | • Paper plates<br>• Counters<br>• Number Lines |

## Stage Two – mental and informal written strategies for multiplication and division

| Stage Two – recall number facts (10x10) – at first 2,3,5,10 – then 4,6,7,8,9<br>    – introduce symbols × and ÷<br>    – language: product, factors (4 is a factor of 12 because 12÷3+4), multiples (the product of two numbers-12 is a multiple of 3 because 3x4=12)<br>    – Strategies of doubling, link multiplication and division, commutative properties (5x8=8x5), repeated addition, using place value, factorising<br>    – whole number remainders in division | |
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| Activity | Resource |
| **1. Arrays/Link × and ÷**<br>What is 3 x 4?  3 rows of 4 is 12        3 × 4 = 12<br>4 columns of 3 is 12     4 × 3 = 12<br>12 shared into 3 rows is 4     12 ÷ 3 = 4<br>12 shared into 4 columns is 3  12 ÷ 4 = 3<br>**2. Area Model for Multiplication** | • Counters<br>• White Boards<br>• Markers |

e.g. 27 x 8 =


160 + 56 = 216

**3. Repeated Addition for Multiplication**

3 × 20: 20 + 20 + 20 = 60

**4. Place Value for Multiplication**

3 × 20: 3 × 2 tens = 6 tens = 60

**5. Using Known Facts**

5 × 7 is 35, so 6 × 7 is 7 more, which is 42

**6. Doubling and Repeated Doubling for Multiplication**

What is 7 x 8?

7 x 8 is
2 x 8 = 16
2 x 8 = 16
2 x 8 = 16
1 x 8 = 8
Link to Addition

**7. Factorising for Multiplication**

5 × 8 is the same as 5 × 2 × 4, which becomes 10 × 4

**8. Link × and ÷ for Division (Inverse Operations)**

e.g. 6 x 4 = 24 so 24 ÷ 6 = 4 and 24 ÷ 4 = 6

**9. Using informal recording methods/concrete materials for Division**

-repeated halving to divide by 2, 4 or 8

-relationship between division facts, e.g. to divide by 5, first divide by 10 and then multiply by 2

## Stage Three – selects/applies appropriate strategies for multiplication and division, applies order of operations
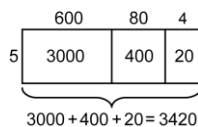
| Stage Three – Strategies of using Place Value, Area Model, Formal Algorithm, Order of Operations | |
|---|---|
|       – larger numbers <br>       – word problems <br>       – in division, remainders as a whole number/fraction/decimal <br>       – estimation/rounding off | |
| **Activity** | **Resource** |
| **1. Using Place Value for Multiplication** <br> Multiplying the thousands, then the hundreds, then the tens and then the ones, <br> e.g. 673 x 4 = (60 0 x 4) + (70 x 4) + (3 x 4) <br>           = 2400 + 280 + 12 <br>           = 2692 <br><br> **2. Area Model** <br> e.g. 684 x 5 = <br>  <br><br> **3. Formal Algorithm** <br> e.g. 432 x 5 = <br>  <br><br> **4. Division** <br> Note the different division notations:  <br><br> **5. Using Place Value for Division** <br> e.g. 3248÷4=  <br><br><br> **6. Formal Algorithm for Division** <br> e.g. 587÷6=  <br> Remainder as a fraction <br><br> **7. Order of Operations** <br> e.g. 5 + (2 x 3) = 5 + 6 = 11 | • Whiteboards <br> • Markers |