

# Developing Multiplication and Division Facts with Understanding — Not Gimmicks!

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# Number Fact Strategies

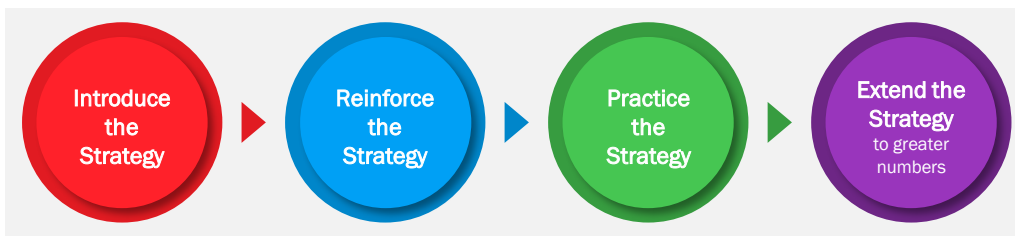
## MULTIPLICATION

- Use Tens (5s facts)
- Use Doubles (2s, 4s, and 8s facts)
- Use a Rule (1s and 0s facts)
- Build Up and Build Down (9s and 6s facts)

## DIVISION

- Think Multiplication

## The Teaching Sequence



# Tens Or Fives

$2 \times 10 = \underline{\hspace{1cm}}$ $2 \times 5 = \underline{\hspace{1cm}}$	$4 \times 10 = \underline{\hspace{1cm}}$ $4 \times 5 = \underline{\hspace{1cm}}$	$7 \times 10 = \underline{\hspace{1cm}}$ $7 \times 5 = \underline{\hspace{1cm}}$	$3 \times 10 = \underline{\hspace{1cm}}$ $3 \times 5 = \underline{\hspace{1cm}}$	$2 \times 10 = \underline{\hspace{1cm}}$ $2 \times 5 = \underline{\hspace{1cm}}$
$6 \times 10 = \underline{\hspace{1cm}}$ $6 \times 5 = \underline{\hspace{1cm}}$	$2 \times 10 = \underline{\hspace{1cm}}$ $2 \times 5 = \underline{\hspace{1cm}}$	$8 \times 10 = \underline{\hspace{1cm}}$ $8 \times 5 = \underline{\hspace{1cm}}$	$5 \times 10 = \underline{\hspace{1cm}}$ $5 \times 5 = \underline{\hspace{1cm}}$	$1 \times 10 = \underline{\hspace{1cm}}$ $1 \times 5 = \underline{\hspace{1cm}}$
$9 \times 10 = \underline{\hspace{1cm}}$ $9 \times 5 = \underline{\hspace{1cm}}$	$8 \times 10 = \underline{\hspace{1cm}}$ $8 \times 5 = \underline{\hspace{1cm}}$	$3 \times 10 = \underline{\hspace{1cm}}$ $3 \times 5 = \underline{\hspace{1cm}}$	$7 \times 10 = \underline{\hspace{1cm}}$ $7 \times 5 = \underline{\hspace{1cm}}$	$5 \times 10 = \underline{\hspace{1cm}}$ $5 \times 5 = \underline{\hspace{1cm}}$
$3 \times 10 = \underline{\hspace{1cm}}$ $3 \times 5 = \underline{\hspace{1cm}}$	$7 \times 10 = \underline{\hspace{1cm}}$ $7 \times 5 = \underline{\hspace{1cm}}$	$6 \times 10 = \underline{\hspace{1cm}}$ $6 \times 5 = \underline{\hspace{1cm}}$	$2 \times 10 = \underline{\hspace{1cm}}$ $2 \times 5 = \underline{\hspace{1cm}}$	$9 \times 10 = \underline{\hspace{1cm}}$ $9 \times 5 = \underline{\hspace{1cm}}$
$8 \times 10 = \underline{\hspace{1cm}}$ $8 \times 5 = \underline{\hspace{1cm}}$	$1 \times 10 = \underline{\hspace{1cm}}$ $1 \times 5 = \underline{\hspace{1cm}}$	$9 \times 10 = \underline{\hspace{1cm}}$ $9 \times 5 = \underline{\hspace{1cm}}$	$4 \times 10 = \underline{\hspace{1cm}}$ $4 \times 5 = \underline{\hspace{1cm}}$	$7 \times 10 = \underline{\hspace{1cm}}$ $7 \times 5 = \underline{\hspace{1cm}}$

Cube A: 6, 5, 4, 3, 2, 1

Cube B: 9, 9, 8, 8, 7, 7

## Times Tussle

20	50	25	50	10	30
70	30	10	90	45	80
35	40	25	40	15	45
80	15	50	100	90	35
45	25	20	40	50	100
45	25	30	20	30	15
70	60	35	60	20	40

# REINFORCE: Double and Halve

## Nice and Easy

$30 \times 3$	$50 \times 3$	$70 \times 3$	$90 \times 3$
$30 \times 4$	$50 \times 4$	$70 \times 4$	$90 \times 4$
$30 \times 6$	$50 \times 6$	$70 \times 6$	$90 \times 6$
$30 \times 7$	$50 \times 7$	$70 \times 7$	$90 \times 7$
$30 \times 8$	$50 \times 8$	$70 \times 8$	$90 \times 8$
$30 \times 9$	$50 \times 9$	$70 \times 9$	$90 \times 9$

Cube A: 15, 15, 25, 35, 45, 45

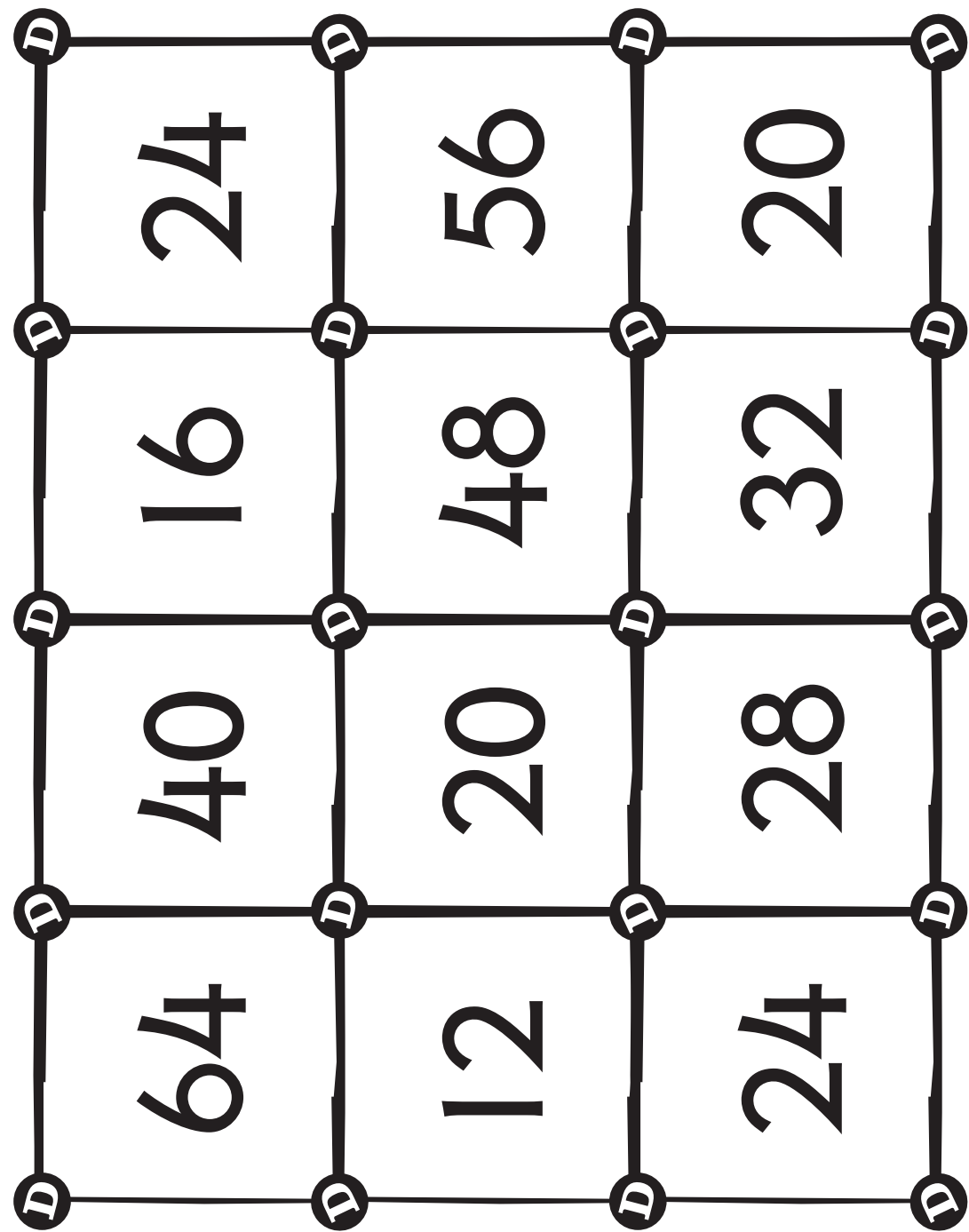
Cube B: 6, 8, 12, 14, 16, 18

## Nice and Easy Too!

90	150	210	270
120	200	280	360
180	300	420	540
210	350	490	630
240	400	560	720
270	450	630	810

REINFORCE: Use Doubles

Do the *D*s



Cube A: 3, 4, 5, 6, 7, 8

Cube B: DD, DD, DD, DDD, DDD, DDD

Burnett, J. & Tickle, B. (2007). *Fundamentals: Purple Level*, page 54. ORIGO Education.

# CONNECT MULTIPLICATION AND DIVISION

## Take or Tally

Player 1

Player 2

$24 \div \underline{\quad} = \underline{\quad}$

$24 \div \underline{\quad} = \underline{\quad}$

$20 \div \underline{\quad} = \underline{\quad}$

$20 \div \underline{\quad} = \underline{\quad}$

$18 \div \underline{\quad} = \underline{\quad}$

$18 \div \underline{\quad} = \underline{\quad}$

$16 \div \underline{\quad} = \underline{\quad}$

$16 \div \underline{\quad} = \underline{\quad}$

$15 \div \underline{\quad} = \underline{\quad}$

$15 \div \underline{\quad} = \underline{\quad}$

$12 \div \underline{\quad} = \underline{\quad}$

$12 \div \underline{\quad} = \underline{\quad}$

Tally

Tally

Cube A: 2, 3, 4, 2, 3, 4

Cube B: 5, 6, 8, 5, 6, 8



# Directions for the Games

## Tens or Fives

### Focus:

Using tens facts to multiply by five

### Materials:

2 cubes with the following configuration

Cube A: 1, 2, 3, 4, 5, 6

Cube B: 7, 7, 8, 8, 9, 9

Game board

Each player will need a coloured pencil or marker of a different colour

### Directions:

The winner is the first to build a winning sequence of four adjacent counters in a horizontal, vertical, or diagonal line, or to make a box of four.

### How to Play:

Roll both cubes.

Choose to multiply the number on cube A or B by 10. Find that fact on the board and fill in the product for multiplying the chosen number by ten and by five. Four in any direction wins.

Some numbers appear more than once on the gameboard. Players must decide whether to build a winning sequence or block the other player.

If both possible numbers are not available, the player misses a turn.

Play continues until one player builds a winning sequence.

## Times Tussle

### Focus:

Multiplying numbers two to ten by five and ten

### Materials:

3 cubes with the following configuration: cube A should be one colour; B & C should be the same colour as each other, but a different colour than cube A.

Cube A: 5, 5, 5, 10, 10, 10

Cube B: 2, 3, 4, 5, 6, 7

Cube C: 5, 6, 7, 8, 9, 10

Each player will need 14 transparent counters (different colour for each player)

### Directions:

The winner is the first player to build a winning sequence four adjacent counters in a horizontal, vertical, or diagonal line.

### How to Play:

Roll all cubes and choose Cube A and one other cube.

Multiply and cover the product. Four in row, any direction wins.

Some numbers appear more than once on the game board. You must decide whether to build a winning sequence or block the other player.

If both possible answers are not available, you miss a turn.

Play continues in turns until one player builds a winning sequence.

For ideas on how to bring out the mathematics in this game, see Fundamentals (Purple) pp. 28-31.

## Do the Ds

### Focus:

Use a doubling strategy to practice fours and eights facts.

### Materials:

Do the Ds game board

One doubling cube labeled with DD on 3 faces (for double, double) and labeled with DDD on 3 faces (for double, double, double)

One cube labeled with numerals 3, 4, 5, 6, 7, 8

Four colour counters for each player (a different colour for each player)

### Directions:

The winner is the player who is the first to place all four counters on the game board.

### How to Play:

Player 1 rolls the cubes and follows the instruction, doubling the number two or three times.

The player claims the answer on the game board by covering it with a counter. If an answer is unavailable, the player misses a turn.

Each of the other players has a turn.

The first player to place all four counters on the game board is the winner.

### Example:

Lily rolls 4 and DDD. She says, "Double 4 is 8, double 8 is 16, double 16 is 32. Four multiplied by 8 is 32."

Lily places her counter on the 32 and claims that space.

For ideas on how to bring out the mathematics in this game, see Fundamentals Purple (pp.52-53)

## Take or Tally

### Focus:

Using multiplication to divide

### Materials:

Two number cubes configured as follows:

Cube A: 2, 3, 4, 2, 3, 4

Cube B: 5, 6, 8, 5, 6, 8

Take or Tally Game board

### Directions:

The first player to complete his/her side before receiving 5 tallies is the winner.

### How to Play:

First player rolls both cubes.

Player writes the two numbers in one of the number sentences on his/her game board. The completed equation must be true.

If a true sentence cannot be made, the player makes a tally in the space provided at the bottom of the game board.

The first player to complete 6 equations before making 5 tallies is the winner

# Multiplication and Division Strategies Videos

Introducing the ORIGO Model for Teaching Skills

ORIGO One: <https://origo-education.wistia.com/medias/26icnyoznj>

Teaching the Use-Tens Strategy for Multiplication

ORIGO One: <https://origo-education.wistia.com/medias/gyw3z0dyld>

GS9: Exploring a strategy to Multiple by Five

Gem Stones: <https://www.youtube.com/watch?v=g0qNTyY8yz8>

GS8: Using arrays to explore turn around facts for multiplication

Gem Stones: <https://youtu.be/WhXryzUmX5Y>

Teaching the Doubling Strategy for Multiplication

ORIGO One: <https://origo-education.wistia.com/medias/ikn1y886en>

Teaching the Build-Up Strategy for Multiplication

ORIGO One: <https://origo-education.wistia.com/medias/17saqfy40q>

Teaching the Build-Down Strategy for Multiplication

ORIGO One: <https://origo-education.wistia.com/medias/gtwhame631>

GS21: Building Down from a Known “tens” Facts to Multiply by 9

Gem Stones: <https://www.youtube.com/watch?v=GDwhFy5PsGM>

Teaching the Think-Multiplication Division Strategy

ORIGO One: <https://origo-education.wistia.com/medias/aOn12cd5d2>