



# **Book and Box of Facts**

## **Multiplication and Division**



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# Number Fact Strategies

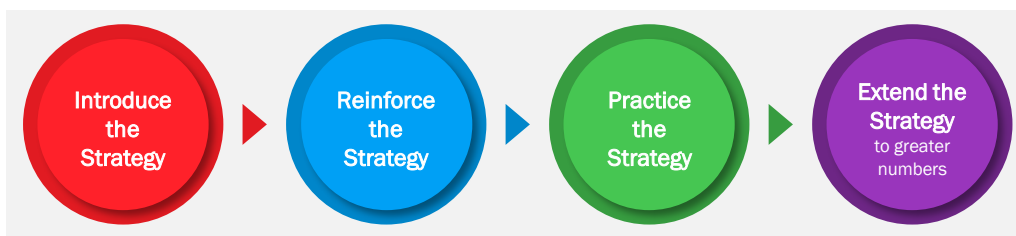
## MULTIPLICATION

- 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



# REINFORCE: Five and Tens Facts

## Tens Or Fives

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

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

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

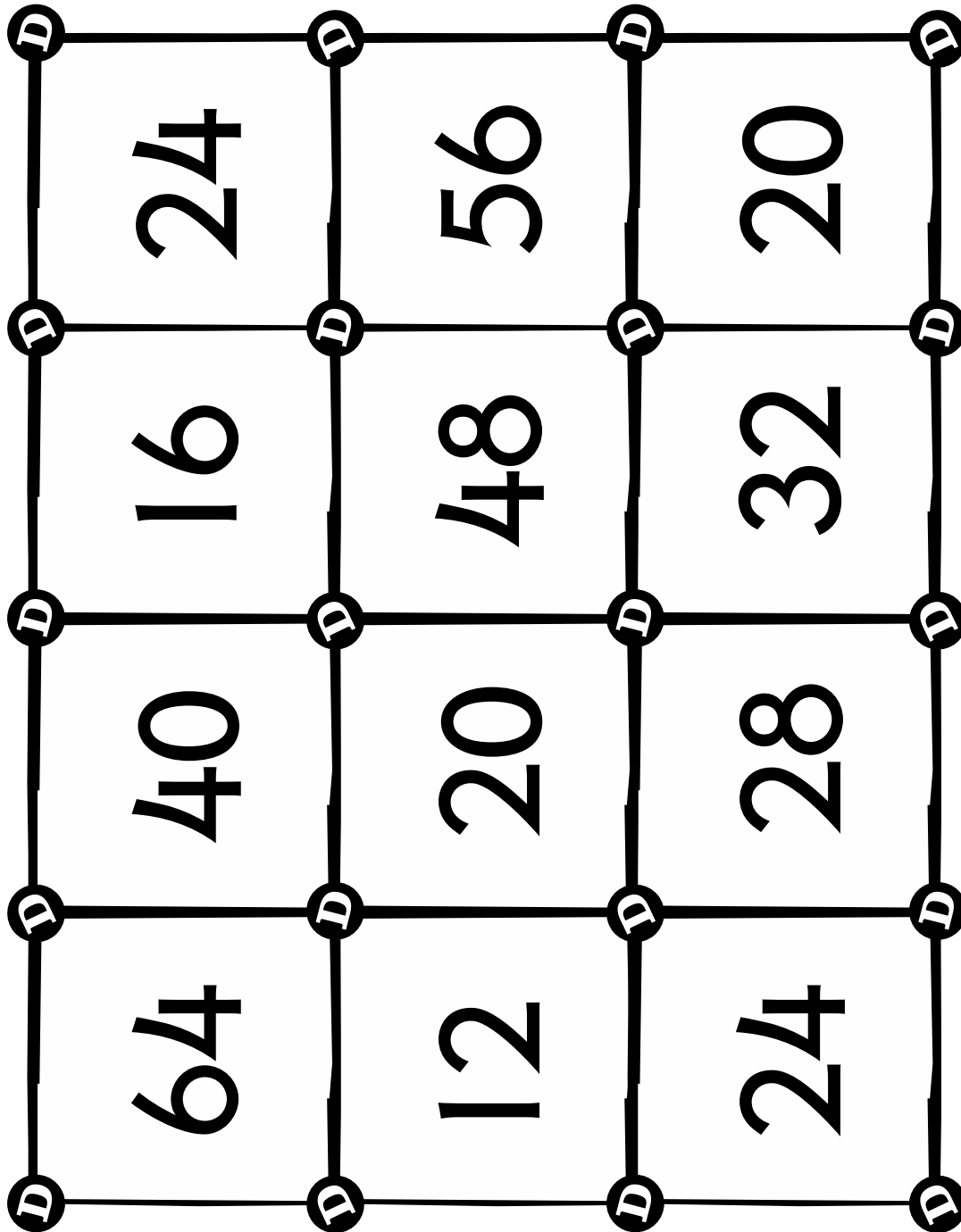
# PRACTICE: Five and Tens Facts

## 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: Fours and Eights Facts

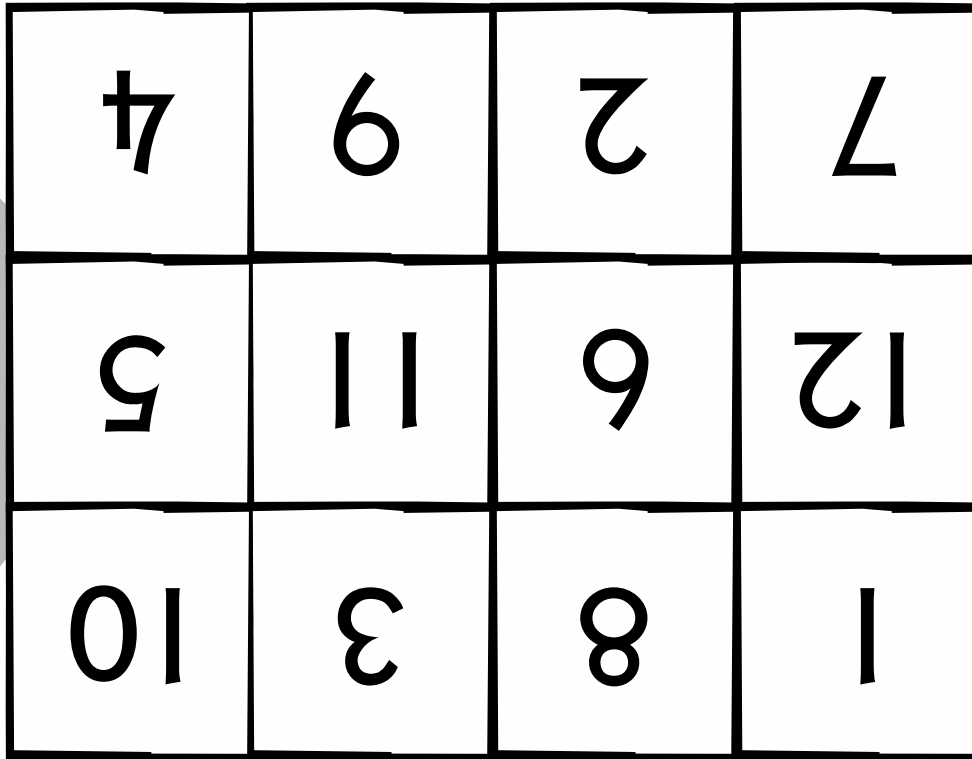
## Do the Ds



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

Cube B:

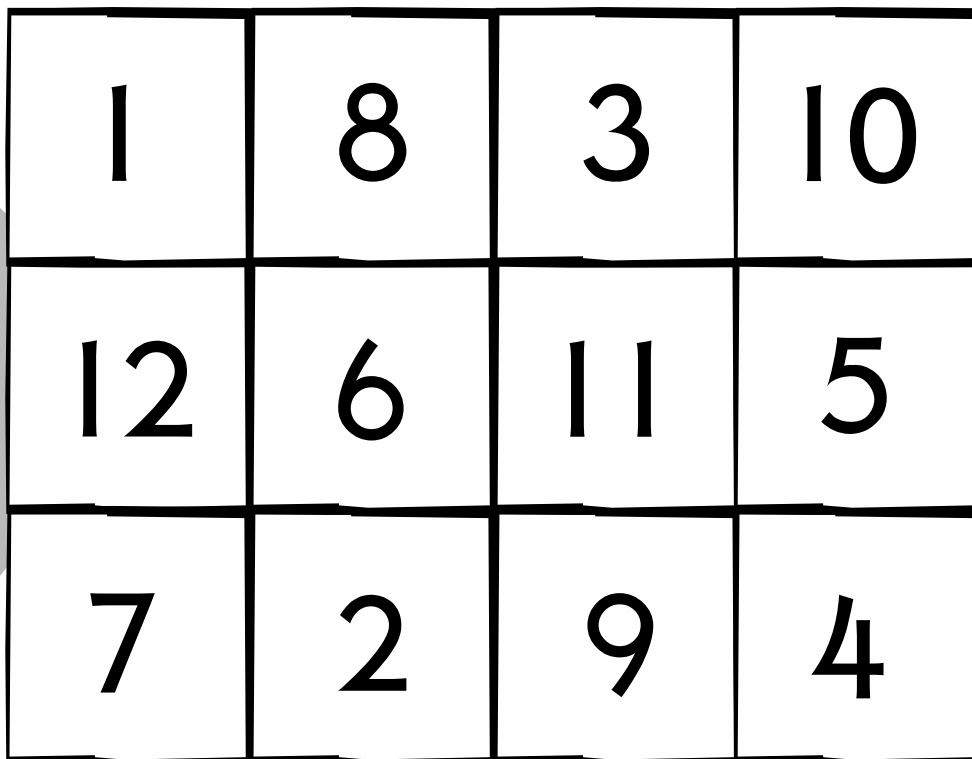
# Half and Half



4	9	2	7
5	11	6	12
10	3	8	1

Player Two

Player One



1	8	3	10
12	6	11	5
7	2	9	4

# Pick a Product

4	16	5	36	6
24	1	30	10	12
6	12	20	24	18
15	8	25	2	6
3	18	4	12	9

# 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 colored pencil or marker of a different color

**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 color; B & C should be the same color as each other, but a different color 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 color 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 color counters for each player (a different color 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)

## Half and Half

### Focus:

Dividing by two and four

### Materials:

Each pair will need: Half and Half game board and one set of Half and Half numeral cards

Each player will need: ten counters (a different color for each player)

### Directions:

The winner is the first player to arrange three counters adjacently in a horizontal, vertical, or diagonal line.

### How to Play:

Shuffle the Half and Half numeral cards and place them face down in a stack.

Player 1 draws a card from the top and either halves the number or halves and halves it again to obtain an answer available on the game board.

The player chooses and claims the answer on the game board by covering with a counter. If the answer is unavailable the player misses a turn.

If an odd number is drawn, the player misses a turn, as odd numbers cannot be halved or quartered to produce a whole number.

The card is returned to the bottom of the stack.

The other player has a turn.

The first player to make a line of three adjacent counters is the winner.

### Example:

Sasha draws a 36. She can halve it to make 18 (36 divided by 2 is 18) or halve and halve it again to make 9 (36 divided by 4 is 9). Sasha can decide if she wants to cover 18 or 9.

For ideas on how to bring out the mathematics in this game, see Fundamentals Purple (pp.60-61)

## Pick a Product

**Focus:**

Reinforcing multiplication number facts

**Materials:**

Each pair of players will need:

Pick a Product game board

Three standard number cubes showing 1-6

Each player will need:

Twelve counters (a different color for each player)

**Directions:**

The first player to arrange four counters in a 2 x 2 square or adjacently in a horizontal, vertical, or diagonal line.

**How to Play:**

The first player rolls the three number cubes.

The player chooses two of the number rolled that when multiplied make a product on the game board.

The player claims the product on the game board by covering with a counter. Although some numbers appear more than once on the game board, a player may only claim one number for each turn. If all possible products are unavailable, the player misses a turn.

The other player has a turn.

The first player to make a 2 x 2 square or a line of four adjacent counters is the winner.

For ideas on how to bring out the mathematics in this game, see Fundamentals Purple (pp.24-27)

## 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://vimeo.com/202679104>

Teaching the Use-Tens Strategy for Multiplication

ORIGO One: <https://vimeo.com/181662318>

GS9: Exploring a strategy to Multiply 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://vimeo.com/181656033>

Teaching the Build-Up Strategy for Multiplication

ORIGO One: <https://vimeo.com/181656041>

Teaching the Build-Down Strategy for Multiplication

ORIGO One: <https://vimeo.com/181656036>

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://vimeo.com/181656040>

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Tickle, Brian, and James Burnett. *Fundamentals: Games to Develop and Reinforce Mental Computation Strategies*. ORIGO Education, 2007.

# Half and Half

1	2	3	4	5	<u>6</u>
7	8	<u>9</u>	10	11	12
13	14	15	<u>16</u>	17	18
<u>19</u>	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

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