



# To Proficiency and Beyond: Strategic Approach to Multiplication and Division

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How could we figure out the cost  
of buying 4 hats?



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# WHAT'S THE PROBLEM?

Carefully read each story problem.

- Check (✓) the box to indicate the operation described.
- For each multiplication problem, write whether the model is equal groups, an array or comparison.
- For each division problem, write whether the story suggests sharing or grouping.
- It is not necessary to answer the problems.

1. a. A running track is 400 meters long. How far will you run if you complete 6 laps of the track?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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b. If a team of 4 people completed one lap in a relay race, how far would each person run?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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2. a. A robot packs cans into boxes. There are 3 rows in each box and 4 cans in each row. How many cans in a box?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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b. How many cans in 5 boxes?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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3. a. Bryce caught 4 fish. Beth caught 3 times as many. How many fish did Beth catch?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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b. How many more fish did Beth catch than Bryce?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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4. a. It takes Ella 6 minutes to clean the snow off one car at the dealership. How many cars can she clean in an hour?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

\_\_\_\_\_

b. Ella has 6 cars to wash in 3 hours. How much time can she spend washing each car?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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5. a. Joel collected 40mL of water from a leaking faucet in 1 hour. How many milliliters would be collected after 3 hours?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

\_\_\_\_\_

b. How long would it take to collect 1 liter of water?

|   |   |   |
|---|---|---|
| × | ÷ | ? |
|---|---|---|

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# Number Fact Strategies

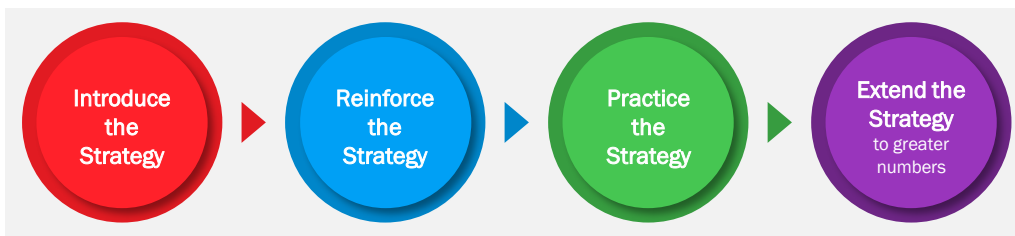
## MULTIPLICATION

- 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





## 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



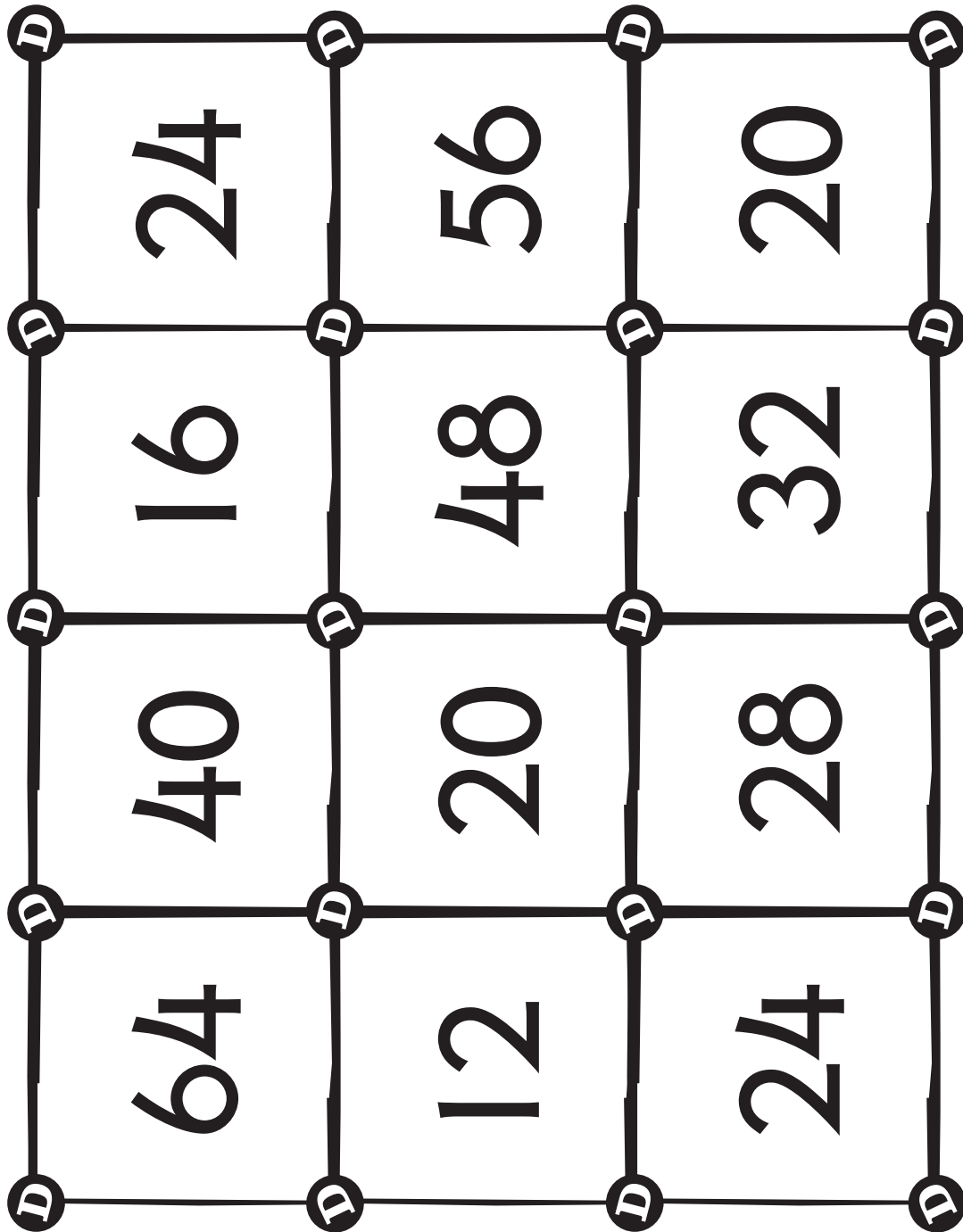
# PRACTICE: Double and Halve

## 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 Ds



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

Cube B: , , , , ,

# 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)

## 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/a0n12cd5d2>