



# Strategies, Models, and Games to Promote Flexible Fact Fluency in Multiplication and Division

NCTM Seattle  
2018



# NUMBER FACT STRATEGIES

## MULTIPLICATION

- Use tens (5s)
- Make generalizations (1s and 0s)
- Use doubles (2s, 4s, and 8s)
- Build up/down (9s and 6s)

## DIVISION

- Think multiplication

## TEACHING SEQUENCE

- Introduce
- Reinforce
- Practice
- Extend

## Sequence for Teaching Skills

Introduce  
the  
strategy



This stage involves the use of **concrete** materials and **pictorial** representations to model the strategy.

At this first stage, ORIGO resources also include **contextual situations** to provide meaning.



## Sequence for Teaching Skills

Introduce  
the  
strategy



Reinforce  
the  
strategy



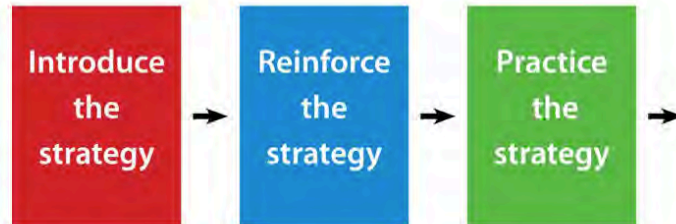
```
graph LR; A[Introduce the strategy] --> B[Reinforce the strategy]; B --> C[ ];
```

This stage provides the opportunity for the students to **assimilate** and **internalize** the strategy.

It is an additional link that **connects** the models of the introductory stage to the symbols of the practice stage.



## Sequence for Teaching Skills



This stage aims to develop **accuracy** and increase **speed** of recall.

In this stage, a range of different types of written and oral activities is used.

## Sequence for Teaching Skills



This stage moves the strategy to examples **beyond** the number fact range, including computation with **decimals**.

# Tens Or Fives

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

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



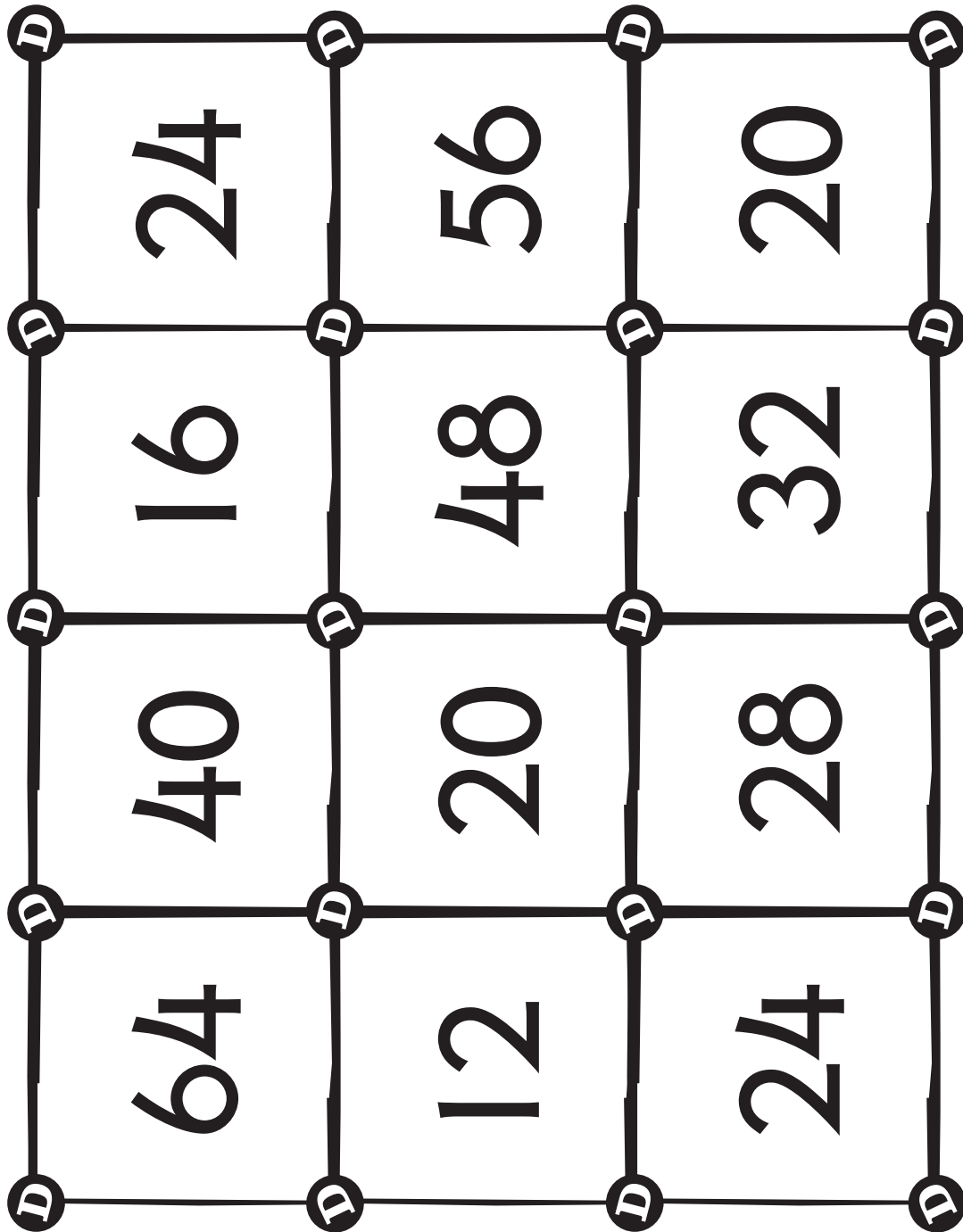
# PRACTICE: Double and Halve

## 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: , , , , ,