



# Developing Fact Fluency through Visual Models

MCTM Duluth 2019



# NUMBER FACT STRATEGIES

## ADDITION

- Count-on 1, 2 and 0
- Doubles and near doubles
- Make ten

## SUBTRACTION

- Think addition

## 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 (see page 2)
- Reinforce (see page 2)
- Practice (see page 4)
- Extend (see page 4)

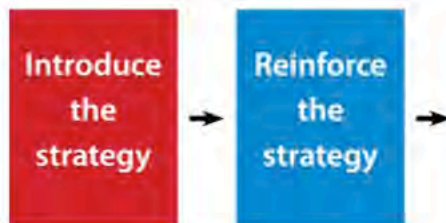
## The Introduce Stage



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.

## The Reinforce Stage

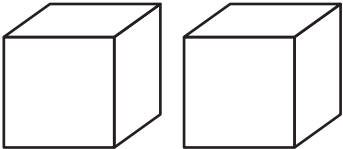
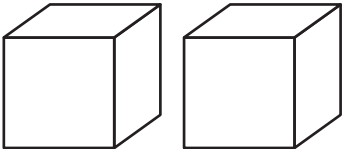
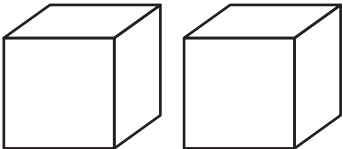
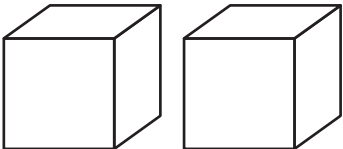
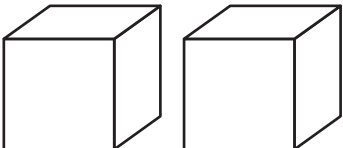


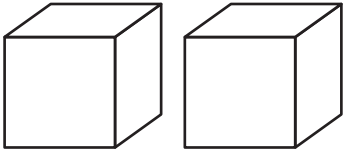
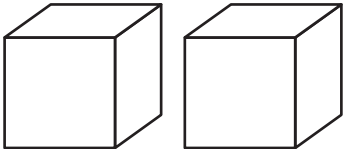
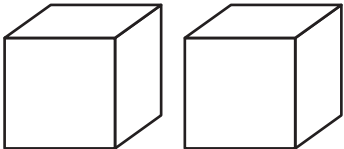
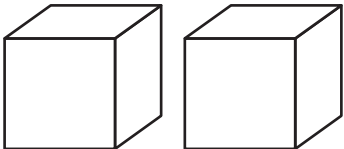
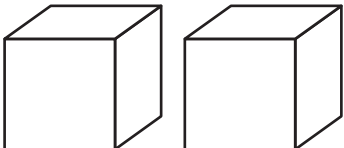
This stage provides the opportunity for the students to assimilate and internalize the strategy.

It is an additional link using pictorial models between the introductory work and the symbolic.

# REINFORCE: Count on 1 and 2

- Roll your number cubes and count on 1 or 2.
- Find your answer below.
- Write your numbers on the number cubes. Write the number fact.

 ___ + ___ = 11
 ___ + ___ = 5
 ___ + ___ = 9
 ___ + ___ = 8
 ___ + ___ = 7

 ___ + ___ = 6
 ___ + ___ = 8
 ___ + ___ = 7
 ___ + ___ = 6
 ___ + ___ = 10

Cube A: 4, 5, 6, 7, 8, 9

Cube B: 

## The Practice Stage



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.

## The Extend Stage



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

# ADDITION CHART

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

- Count-on facts
- Use doubles facts
- Make ten facts

## REINFORCE: Double-add-1

11	19	13	15
13	9	17	19
17	11	15	9

Cube: 4, 5, 6, 7, 8, 9 (Same as previous game)



# INTRODUCE: Make Ten


# REINFORCE: Make Ten

- Roll your number cubes and write the fact below the example in the grid that will help you figure out the answer.
- Write the answer to both facts.

$10 + 6 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 + 5 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 + 5 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 + 4 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
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$10 + 2 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 + 1 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$

$10 + 6 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 + 5 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
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$10 + 2 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 + 1 = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$

Cube A: 8, 8, 8, 9, 9, 9

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

# Extensions Across Grades

Begin with a special fact strategy

Strategies	First Extension	Further Extensions	Decimal Extensions
Count-on 6 + 1 9 + 2	Count-on 16 + 1 19 + 2	Count-on 26 + 21 29 + 12	Count-on 3.6 + 2.1 2.9 + 1.2
Use doubles 7 + 7 6 + 5	Use doubles 25 + 25 26 + 25	Use doubles 27 + 27 126 + 125	Use doubles 2.5 + 2.5 1.26 + 1.25
Make ten 9 + 4	Make ten 39 + 4	Make ten 198 + 25	Make ten 1.98 + 0.6



## Addition Chart

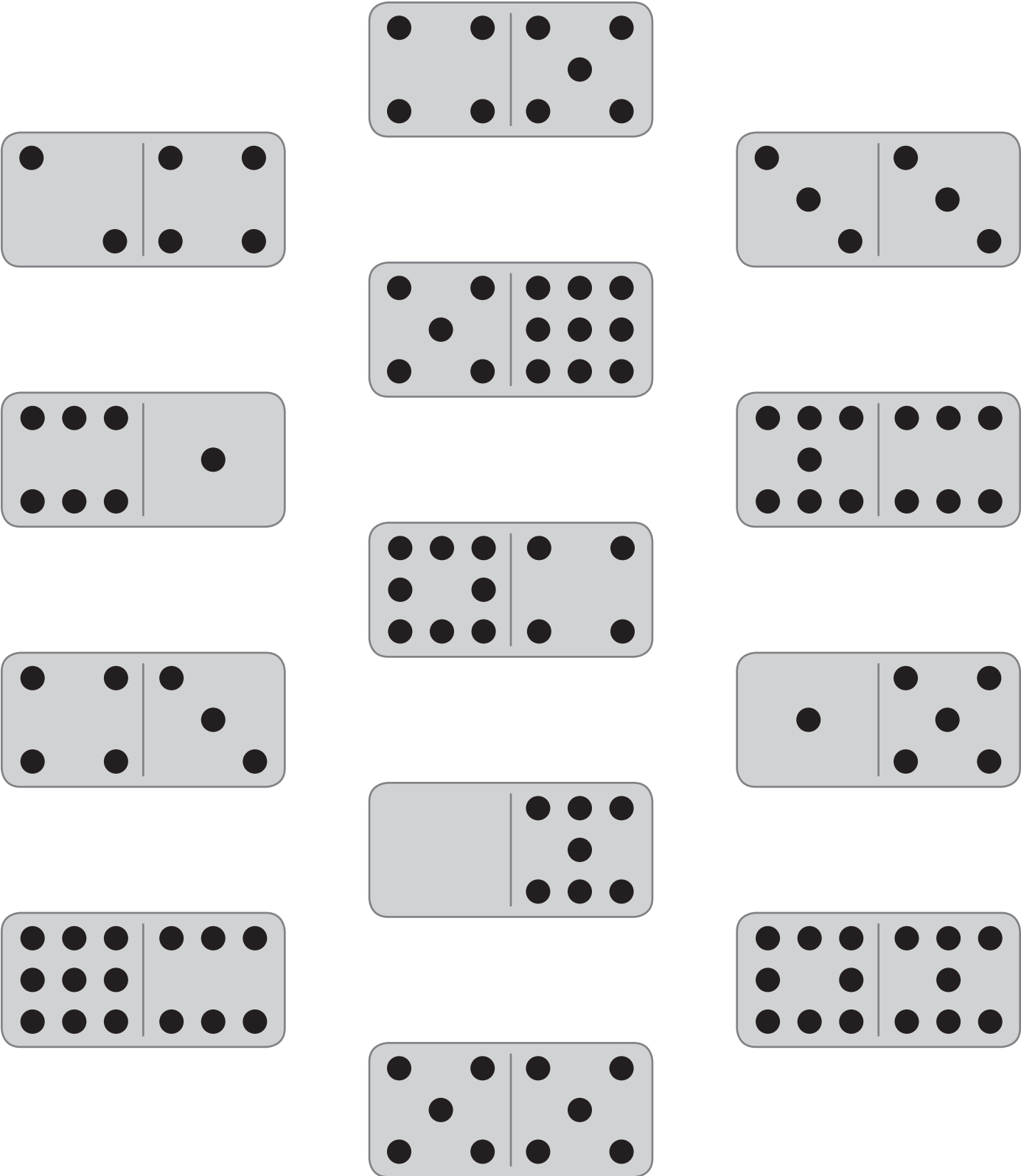
- Count on
  - count on 1
  - count on 2
  - count on 0
- Use doubles
  - doubles
  - double-add-1
  - double-add-2
- Make ten
- The last facts

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18



# DOMINO SORT

Sort these dominos according to the addition strategy you would use to calculate the total number of dots.



- Count On
- Use Doubles
- Make Ten