FLUENCY: THE MISSING LINK FOR ADDITION AND SUBTRACTION

PROFESSIONAL LEARNING
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ORIGO EDUCATION

NUMBER FACT STRATEGIES

ADDITION

- Count-on 1, 2 and 0
- Use doubles
- Make ten

SUBTRACTION

- Think addition

MULTIPLICATION

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

DIVISION

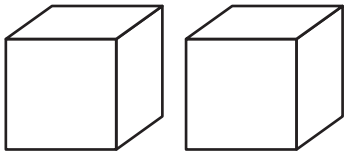
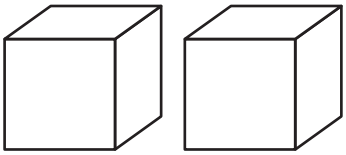
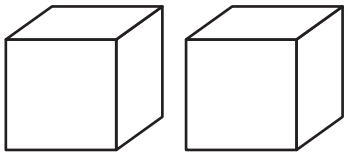
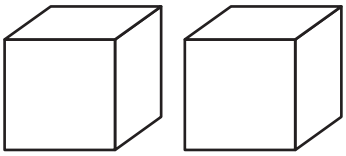
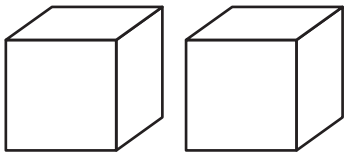
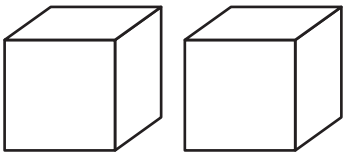
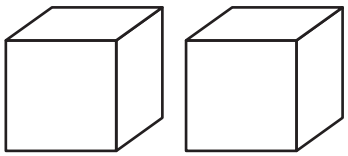
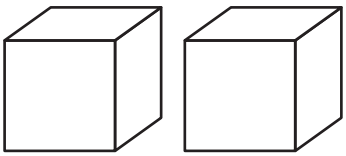
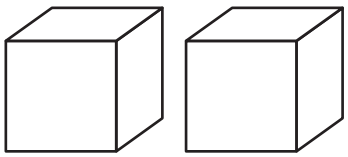
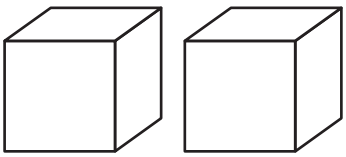
- Think multiplication

TEACHING SEQUENCE

- Introduce
- Reinforce
- Practice
- Extend

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	 ____ + ____ = 6
 ____ + ____ = 5	 ____ + ____ = 8
 ____ + ____ = 9	 ____ + ____ = 7
 ____ + ____ = 8	 ____ + ____ = 6
 ____ + ____ = 7	 ____ + ____ = 10

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

Cube B: 

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

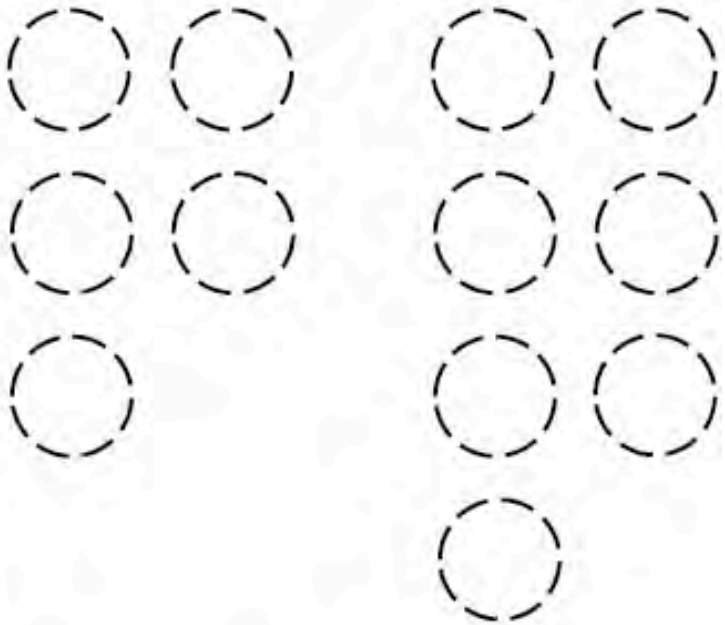
11	19	13	15
13	9	17	19
17	11	15	9

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

Name _____

Place counters or pennies on the circles. Then write the fact you see.
Move one counter to make an easier fact to solve. Complete the new fact.

a.

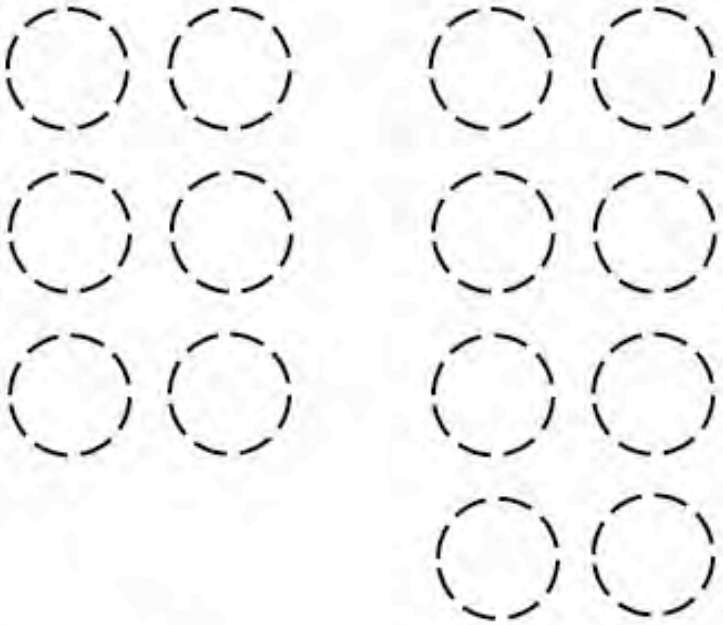


I see _____ + _____

but

I solve _____ + _____ = _____

b.



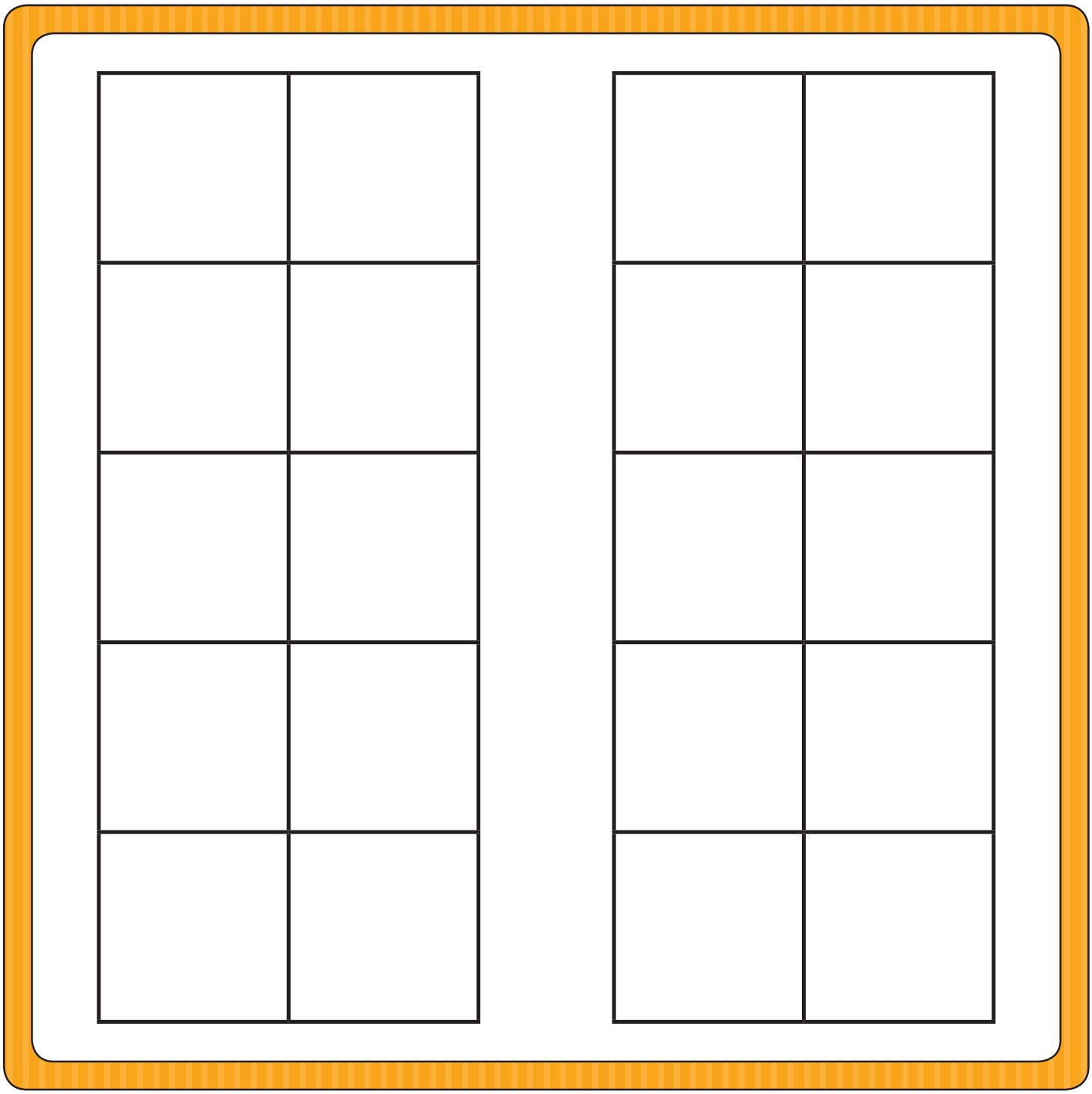
I see _____ + _____

but

I solve _____ + _____ = _____

GemStones™

INTRODUCE: Make Ten



ORIGO Education: *Box of Facts (Addition and Subtraction)*

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.

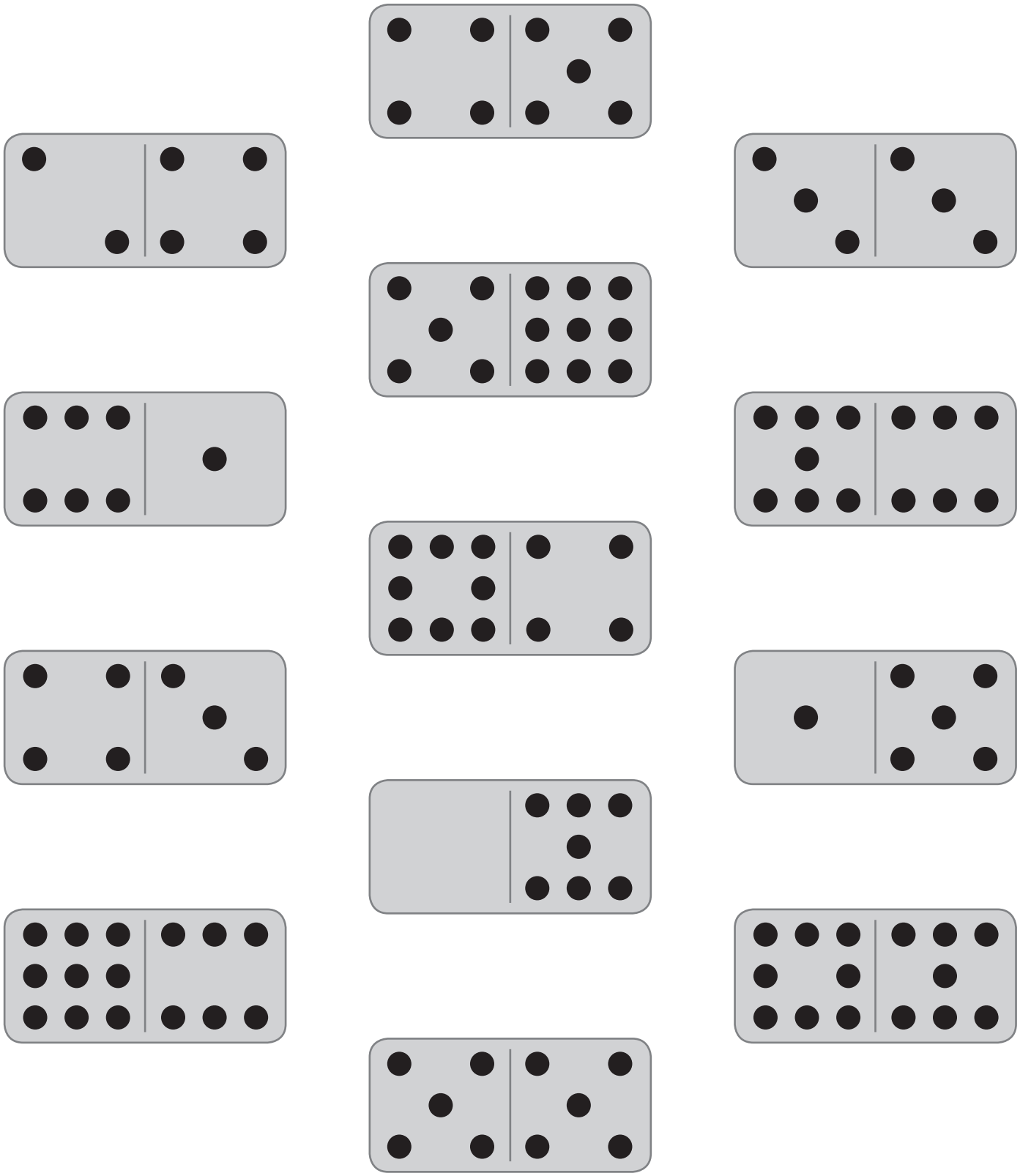
10 + 6 = ____ ____ + ____ = ____	10 + 6 = ____ ____ + ____ = ____
10 + 5 = ____ ____ + ____ = ____	10 + 5 = ____ ____ + ____ = ____
10 + 5 = ____ ____ + ____ = ____	10 + 5 = ____ ____ + ____ = ____
10 + 4 = ____ ____ + ____ = ____	10 + 4 = ____ ____ + ____ = ____
10 + 4 = ____ ____ + ____ = ____	10 + 4 = ____ ____ + ____ = ____
10 + 3 = ____ ____ + ____ = ____	10 + 3 = ____ ____ + ____ = ____
10 + 3 = ____ ____ + ____ = ____	10 + 3 = ____ ____ + ____ = ____
10 + 2 = ____ ____ + ____ = ____	10 + 2 = ____ ____ + ____ = ____
10 + 1 = ____ ____ + ____ = ____	10 + 1 = ____ ____ + ____ = ____

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

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

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

Take or Tally

Player 1	Player 2
13 – _____ = _____	13 – _____ = _____
12 – _____ = _____	12 – _____ = _____
11 – _____ = _____	11 – _____ = _____
10 – _____ = _____	10 – _____ = _____
9 – _____ = _____	9 – _____ = _____
8 – _____ = _____	8 – _____ = _____
Tally	Tally

Cube A: 1, 2, 3, 1, 2, 3

Cube B: 7, 8, 9, 10, 11, 12

Directions for the Games

Count on 1 or 2

Focus:
Adding 1 or 2 using the count on strategy

Materials:
Two number cubes configured as follows:
Cube A: 4, 5, 6, 7, 8, 9
Cube B: 1, 1, 1, 2, 2, 2
Colored pencil or marker for each student in different colors
Game board

Directions:
The player who completes the most equations is the winner.

How to Play:
Player 1 rolls, finds the matching equation with the matching sum and fills in the dice and equation on the game board in his/her color.
Next player rolls and fills in dice and equation in his/her color.
If a player rolls a sum that is already filled, he/she misses a turn.
Play continues until board is filled or time runs out.

Example:
Gertrude rolls a numeral six and 2 dots. She says, Six count on 2 is seven, eight. I will fill in one of the equations with the sum of 8 and fill in the dice to match my roll.

Doubles plus 1

Focus:
Using doubles facts to solve a doubles plus 1 equation

Materials:
Doubles add one game board
Once cube showing the numerals 4, 5, 6, 7, 8, 9
Four counters per player, each player has a different color counter

Directions:
The player who places all four counters on the board first, wins.

How to Play:
First player rolls the number cube and doubles the number rolled, then adds one to it.
Player claims the sum by covering it with a counter. If that sum is already covered, the player misses a turn.
Other players have a turn.

Example:
Carla rolls a 7 and says, "I know that double 7 is 14, so 7 add 8, must be one more, that's 15."

For ideas on how to bring out the mathematics in this game, see Fundamentals Yellow, pp 56-57.

Bridge to Ten

Focus:

Reinforce the Bridge-to-Ten strategy for addition

Materials:

Two number cubes configured as follows:

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

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

Colored pencil or marker for each student in different colors

Game board

Directions:

The player who completes the most equations in their color is the winner. One player plays the left side of the board, one plays the right side. It is possible to add another player or two. In that case, each player would use the entire board and count the equations completed in his/her color at the end of the game.

How to Play:

First player rolls both cubes.

Player finds the tens fact that corresponds to the 8 or 9s fact that is rolled.

Player fills in the sum of the tens fact and the equation for the 8 or nines fact.

Next player has a turn.

Play continues until one player fills a side (in a two-player game), or the board is filled (if more than two are playing), or until time runs out.

Player with the most equations in his/her color is the winner.

Example:

Jorge rolls a 9 and a 5. He says, "I know that 9 is one away from ten, Nine add 5 has the same value as 10 add 4. That's 14. So I will fit in the space with 10 add 4 and add the equation 9 add 5 equals 14.

Cat and Mice

Focus:

Calculating difference for the basic subtraction facts

Materials:

Two number cubes showing numerals 5-10

One counter to represent the cat

Three counters in a different color to represent the mice

45 linking cubes. Connect cubes to make trains to represent each of the numbers 5-10.

Directions:

1) The player for the cat wins if they "capture" all three mice before they reach the spaces marked "home".
To capture a mouse, the player must correctly move their counter onto a space that a mouse counter occupies.
The player for the mice wins if they can avoid be "captured" and all three of their counters reach "home".

2) Decide who will play for the mice and be Player 1, Player 2 will play for the cat.

3) Player 1 places a counter onto each space showing a mouse on the game board. Player 2 places a counter onot the space showing the cat.

How to Play:

Roll the cubes.

Calculate the difference between the numbers rolled and say the answer aloud. The other player must confirm the difference.

A move is one space up, down, left, right, or diagonal in any direction. For Player 1: If your answer is correct, move one of your counters onto an adjacent space that shows the difference. For Player 2: If your answer is correct, move your counter onto an adjacent space that shows the difference.

If an answer is incorrect or the difference is not available on an adjacent space, you miss a turn.

If the two numbers rolled are the same, you miss a turn.

For Player 2: When you move to a space occupied by a mouse counter, take the counter off the game board.

Play continues in turns until all three mouse counters have been removed or the last mouse counter reach "home".

For ideas on how to bring out the mathematics in this game, see Fundamentals Orange (pp. 32-35).

Take or Tally

Focus:

Using addition and subtract

Materials:

Two number cubes configured as follows:

Cube A: 1, 2, 3, 1, 2, 3

Cube B: 7, 8, 9, 10, 11, 12

Game board

Directions:

First to complete his/her side of the game board without 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.

For ideas on how to bring out the mathematics in this game, see Fundamentals Orange (pp28-29).

Addition and Subtraction Strategies Videos

Introducing the ORIGO Model for Teaching Skills
ORIGO One: https://origo-education.wistia.com/medias/26icnyoznj
Short Link: b.link/O1_22_E

Using Five- and Ten-Frames to Represent Numbers
ORIGO One: https://origo-education.wistia.com/medias/affdnul85b
Short Link: b.link/O1_45_E

Teaching the Count-On Strategy for Addition
ORIGO One: https://origo-education.wistia.com/medias/bv1c3s6bht
Short Link: b.link/O1_1_E

GS13: Exploring Doubles in the Real World
Gem Stones: https://youtube.com/watch?v=qfuWSb5CixY
Short Link: https://youtu.be/qfuWSb5CixY

GS14: Doubling Numbers Less Than 10
Gem Stones: https://youtube.com/watch?v=JZt2P4OdGx8
Short Link: https://youtu.be/JZt2P4OdGx8

Teaching the use Doubles Strategy for Addition
ORIGO One: https://origo-education.wistia.com/medias/w14o4303pm
Short Link: b.link/O1_4_E

GS15: Using Doubles to Add "Next Door" Numbers (Doubles-Plus-1 facts)
Gem Stones: https://www.youtube.com/watch?v=KMfqfZHzh8I
Short Link: https://youtu.be/KMfqfZHzh8I

GS16: Using Doubles to Add Nearby Numbers (Doubles-Plus-2 facts)
Gem Stones: https://www.youtube.com/watch?v=0QcCVR6Yqus
Short Link: https://youtu.be/0QcCVR6Yqus

GS5: Exploring combinations that make 10
Gem Stones: https://www.youtube.com/watch?v=qzydNEeHpQw
Short Link: https://youtu.be/qzydNEeHpQw

Using the Make-Ten or Bridge-to-ten Strategy to Addition
ORIGO One: https://origo-education.wistia.com/medias/e7tku31liu
Short Link: b.link/O1_7_E

GS6: Making a "Ten" to Add Basic Facts
Gem Stones: https://www.youtube.com/watch?v=ROuWdXdQ11g
Short Link: https://youtu.be/ROuWdXdQ11g

GS7: Making a Ten to add a 2 digit number and activity
Gem Stones: https://www.youtube.com/watch?v=kq1meaJDirA
Short Link: https://youtu.be/kq1meaJDirA

Teaching the Think-Addition Strategy for Subtraction
ORIGO One: https://origo-education.wistia.com/medias/cm98lr2tax
Short Link: b.link/O1_2_E