# **Math Tool: Ten Frame for Addition**

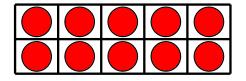
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# **Ten Frames**

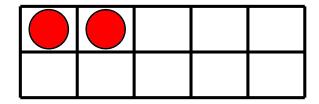
## **Ten Frames**

## **Activities:**

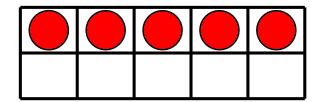
- Represent different numbers on a ten frame
  - Always fill top row first
- Show all combinations that add to 10
  - Record as addition statements
- Show partially completed 10 frame and call out "I wish I had 10" and they tell how many are needed to complete the frame
- Show how to do addition facts like 7 + 5 by using 3 of the 5 and having two left over
- Apply to questions like 37 + 4 keep track of how many complete 10's you have
- Do practice questions
- Try for subtraction questions:
  - 14 5
- With two ten frames, good for showing doubling of 6, 7, 8, 9 and connecting to ending digit (e.g. 3 doubled = 6, 8 doubled = 16 why?)



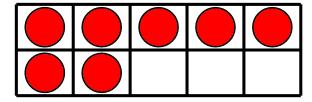
I have \_\_\_\_\_. I need \_\_\_\_\_.



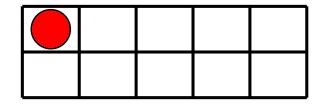
I have \_\_\_\_\_. I need \_\_\_\_\_.



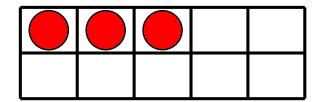
I have \_\_\_\_\_. I need \_\_\_\_\_.



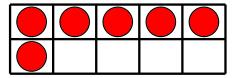
I have \_\_\_\_\_. I need \_\_\_\_\_.



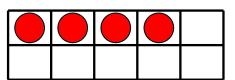
I have \_\_\_\_\_. I need \_\_\_\_\_.



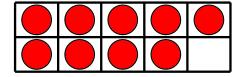
I have \_\_\_\_\_. I need \_\_\_\_\_.



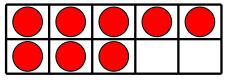
I have \_\_\_\_\_. I need \_\_\_\_\_.



I have \_\_\_\_\_. I need \_\_\_\_\_.



I have \_\_\_\_\_. I need \_\_\_\_\_.



8 + 2 = 10I have \_\_\_\_\_. I need \_\_\_\_\_

R	S	K	=

## **Multiplying Basics**

#### **Task 1: Multiplication Review**

- Multiplication is
  - Repeated addition
  - Repeated groups
  - Area

#### Task 2: Review 0 and 1 timetables

- What is any number multiplied by 0? Why?
- What is any number multiplied by 1? Why?
- Practice:

0	7 x 0	9 x 1
0	0 x 8	1 x 4
0	5 x 1	6 x 1
0	8 x 0	3 x 1

## Task 3: Commutative Property → Order doesn't matter!

- 4 groups of 3 is same as 3 groups of 4
  - Verify with manipulatives
- Practice:
  - 8 x 1 = 8; what is 1 x 8?
  - $\circ$  8 x 2 = 16; what is 2 x 8?
  - $\circ$  9 x 0 = 0; what is 0 x 9?
  - $\circ$  6 x 5 = 30; what is 5 x6?

#### Task 4: Ten times tables

10..0

- Multiplying by 10's is determining how many groups of 10:
  - o 7 x 10 means 7 groups of 10 which is 70;
  - Multiplying by 10 is easy because we just add a 0 to the #
- Count by 10's to 120
- Do 10 timetable in order:

10 x 0 =	
10 x 1 =	10 x 6 =
10 x 2 =	10 x 7 =
10 x 3 =	10 x 8 =
10 x 4 =	10 x 9 =
10 x 5 =	10 x 10 =

## Task 5: Multiplication Questions - Random Order

10 x 6 =	10 x 1 =
10 x 8 =	10 x 4 =
10 x 5 =	10 x 9 =
0 x 9 =	4 x 1 =
10 x 3 =	10 x 2 =
10 x 7 =	10 x 10 =
0 x 27 =	21 x 1 =

#### Task 6: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 10 wins the card.
- Roll a die. Whoever shouts the answer to the die x 10 gets a point. Shout a wrong answer and you subtract two points.

# Multiplying by 2 (Doubling)

### **Task 1: Step Counting**

Count by 2 from 0 to 40

• Repeat three times.

### Task 2: Recite Multiplication Facts in order

2 x 0 =	
2 x 1 =	2 x 6 =
2 x 2 =	2 x 7 =
2 x 3 =	2 x 8 =
2 x 4 =	2 x 9 =
2 x 5 =	2 x 10 =

### Task 3: Doubling

Answer Doubling Facts out of order:

5 doubled $\rightarrow$ ?	3 doubled $\rightarrow$ ?
9 doubled $\rightarrow$ ?	6 doubled $\rightarrow$ ?
10 doubled $\rightarrow$ ?	1 doubled $\rightarrow$ ?
8 doubled $\rightarrow$ ?	7 doubled $\rightarrow$ ?
2 doubled $\rightarrow$ ?	4 doubled $\rightarrow$ ?

### **Task 4: Multiplication Questions**

2 x 6 =	2 x 1 =
2 x 8 =	2 x 4 =
2 x 5 =	2 x 9 =
2 x 3 =	2 x 2 =
2 x 7 =	2 x 10 =

## Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card doubled wins the card.
- Roll a die. Whoever shouts the answer to the die doubled gets a point. Shout a wrong answer and you subtract two points.

#### Task 1: Strategy Review:

- All products of 5 end in '5' or '0'
  - $\circ$  5 x even#  $\rightarrow$  ends in 0
  - $\circ$  5 x odd#  $\rightarrow$  ends in 5
  - Since it takes two 5's to make 10, the number in the 10s column is half of the number you are multiplying by:
    - $5 \times 8$ :  $\rightarrow$  even # so ends in 0; half of 8 is 4 so 4 in tens  $\rightarrow$  40
    - $5 \times 5 \rightarrow \text{odd} \# \text{so ends in 5}$ ; half of 5 is 2 ½ so 2 in tens  $\rightarrow$  25

## **Task 2: Step Counting**

Count by 5 from 0 to 100

• Repeat three times.

#### Task 3: Recite Multiplication Facts in order

5 x 0 =	
5 x 1 =	5 x 6 =
5 x 2 =	5 x 7 =
5 x 3 =	5 x 8 =
5 x 4 =	5 x 9 =
5 x 5 =	5 x 10 =

#### Task 4: Multiplication Questions - Random Order - remember, we know 1x, 2x and 10x

5 x 6 =	5 x 1 =
5 x 8 =	5 x 4 =
5 x 5 =	5 x 9 =
5 x 3 =	5 x 2 =
5 x 7 =	5 x 10 =

#### Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 5 first wins the card.
- Roll a die. Whoever shouts the answer to the die x 5 gets a point. Shout a wrong answer and you subtract two points.

# Multiplying by 4: The Double-Double

### Task 1: Strategy Review:

- All products of 4 are even (answer must be even)
- Multiplying by 4 is like multiplying by 2 twice → double twice → double-double!
  - Until you have 4x table memorized, apply **double-double**

#### **Task 2: Step Counting**

Count by 4 from 0 to 48

- Repeat three times.
  - O Note the pattern: numbers end in 4-8-2-6-0-4-8-2-6-0

0

#### Task 3: Recite Multiplication Facts in order

4 x 0 =	
4 x 1 =	4 x 6 =
4 x 2 =	4 x 7 =
4 x 3 =	4 x 8 =
4 x 4 =	4 x 9 =
4 x 5 =	4 x 10 =

#### Task 4: Multiplication Questions - Random Order (remember, we know 1x, 2x, 5x, 10x)

4 x 6 =	4 x 1 =
4 x 8 =	4 x 4 =
4 x 5 =	4 x 9 =
4 x 3 =	4 x 2 =
4 x 7 =	4 x 10 =

#### Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 4 first wins the card.
- Roll a die. Whoever shouts the answer to the die x 4 gets a point. Shout a wrong answer and you subtract two points.

#### **Task 1: Strategy Review:**

- "Double plus another"  $\rightarrow$  to multiply by 3, we can double the number then add it once more (e.g. 5x3 = 5 doubled or 10, plus one more  $\rightarrow 5$ : 10+5 = 15)
- Reflect on answer:
  - $3 \times \text{even} \# \rightarrow \text{even}$
  - $\circ$  3 x odd#  $\rightarrow$  odd
  - The digits in your answer will add up to 3, 6, or 9! Check it out!

#### **Task 2: Step Counting**

Count by 3 from 0 to 36

Repeat three times.

#### Task 3: Recite Multiplication Facts in order

3 x 0 =	
3 x 1 =	3 x 6 =
3 x 2 =	3 x 7 =
3 x 3 =	3 x 8 =
3 x 4 =	3 x 9 =
3 x 5 =	3 x 10 =

#### Task 4: Multiplication Questions - Random Order -

Remember, we know 0x, 1x, 2x, 4x, 5x, 10x already!

3 x 6 =	3 x 1 =
3 x 8 =	3 x 4 =
3 x 5 =	3 x 9 =
3 x 3 =	3 x 2 =
3 x 7 =	3 x 10 =

#### Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 3 first wins the card.
- Roll a die. Whoever shouts the answer to the die x 3 gets a point. Shout a wrong answer and you subtract two points.
- Play Beep-Bop: As a class, count. But if you come to a multiple of 3 say Beep; for a multiple of 4 say Bop; for a multiple of both (12, 24) say BeepBop
  - o E.g. 1, 2, Beep, Bop, 5, Beep, 7, Bop, Beep, 10, 11, Beep-Bop
  - If you make a mistake you sit!

## Multiplying by 6 - Triple-Double!

### Task 1: Strategy Review: Must have mastery of 3 timetable to progress

- "Trip[le-Double"  $\rightarrow$  to multiply by 6, we can multiply by 3 then double again
  - $\circ$  4 x 6  $\rightarrow$  4 tripled = 12; 12 doubled = 24
- Reflect on answer:
  - 6 x anything  $\rightarrow$  even
  - The digits in your answer will add up to 3, 6, 9, or 12! Check it out!

#### **Task 2: Step Counting**

Count by 6 from 0 to 60

• Repeat three times.

#### **Task 3: Recite Multiplication Facts in order**

6 x 0 =	
6 x 1 =	6 x 6 =
6 x 2 =	6 x 7 =
6 x 3 =	6 x 8 =
6 x 4 =	6 x 9 =
6 x 5 =	6 x 10 =

#### Task 4: Multiplication Questions - Random Order -

Remember, we know 0x, 1x, 2x, 3x, 4x, 5x, 10x already!

6 x 6 =	6 x 1 =
6 x 8 =	6 x 4 =
6 x 5 =	6 x 9 =
6 x 3 =	6 x 2 =
6 x 7 =	6 x 10 =

#### Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 3 first wins the card.
- Roll a die. Whoever shouts the answer to the die x 3 gets a point. Shout a wrong answer and you subtract two points.

#### **Task 1: Strategy Review:**

- Multiply by 10, take away one group → to multiply by 9, we can multiply by 10 then subtract one group
  - $\circ$  9 x 8  $\rightarrow$  10 x 8 = 80; 80 8 = 72
- Reflect on answer:
  - o when multiplying by 9, digits in answer will add to 9
    - E.g.  $9x 3 = 27 \rightarrow 2 + 7 = 9$
  - $\circ$  9 x odd#  $\rightarrow$  odd
  - Can always try the finger trick e.g. for 9x7 put down 7th finger. Tens column is fingers to the left of downed finger, ones column is to the right

### **Task 2: Step Counting**

Count by 9 from 0 to 99

• Repeat three times.

## Task 3: Recite Multiplication Facts in order

9 x 0 =	
9 x 1 =	9 x 6 =
9 x 2 =	9 x 7 =
9 x 3 =	9 x 8 =
9 x 4 =	9 x 9 =
9 x 5 =	9 x 10 =

#### Task 4: Multiplication Questions - Random Order -

Remember, we know 0x, 1x, 2x, 4x, 5x, 6x, 10x already!

9 x 6 =	9 x 1 =
9 x 8 =	9 x 4 =
9 x 5 =	9 x 9 =
9 x 3 =	9 x 2 =
9 x 7 =	9 x 10 =

#### Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 9 first wins the card.
- Roll a die. Whoever shouts the answer to the die x 9 gets a point. Shout a wrong answer and you subtract two points.

#### **Task 1: Strategy Review:**

- Double-Double!: since 8 = 2 x 2 x 2, to multiply by 8 is to double something three times.
  - $\circ$  E.g. 7 x 8 = 7 doubled  $\rightarrow$  14, doubled  $\rightarrow$  28, doubled  $\rightarrow$  56 so 7 x 8 = 56
- Reflect on answer: when multiplying by 8, answer must be even
  - $\circ$  8 x anything  $\rightarrow$  even
- Memorize! The only two 8 time table facts we don't have strategies for are:
  - $\circ$  8 x 7 = 56
  - $\circ$  8 x 8 = 64

#### **Task 2: Step Counting**

Count by 8 from 0 to 80

Repeat three times.

#### Task 3: Recite Multiplication Facts in order

 $8 \times 0 =$ 

8 x 1 = 8 x 6 =

8 x 2 = 8 x 7 =

8 x 3 = 8 x 8 =

8 x 4 = 8 x 9 =

8 x 5 = 8 x 10 =

#### Task 4: Multiplication Questions - Random Order -

Remember, we know 0x, 1x, 2x, 4x, 5x, 6x, 10x already!

8 x 6 =	8 x 1 =
8 x 8 =	8 x 4 =
8 x 5 =	8 x 9 =
8 x 3 =	8 x 2 =
8 x 7 =	8 x 10 =

#### Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 8first wins the card.
- Roll a die. Whoever shouts the answer to the die x 8gets a point. Shout a wrong answer and you subtract two points.

#### Task 1: Strategy Review:

- Reflect on answer: when multiplying by 7,
  - $\circ$  7 x odd#  $\rightarrow$  odd
  - $7 \times \text{even} \# \rightarrow \text{even}$
- Memorize: we have strategies for every other time table so
  - o just know 7x7 = 49
  - Memorize other ones you don't know (e.g. 7 x 8 = 56)

#### **Task 2: Step Counting**

Count by 9 from 0 to 99

Repeat three times.

#### Task 3: Recite Multiplication Facts in order

7 x 0 =

7 x 1 = 7 x 6 =

7 x 2 =

7 x 7 =

 $7 \times 3 =$ 

7 x 8 =

7 x 4 =

 $7 \times 9 =$ 

 $7 \times 5 =$ 

7 x 10 =

#### Task 4: Multiplication Questions - Random Order -

Remember, we know 0x, 1x, 2x, 4x, 5x, 6x, 9x, 10x already!

7 x 6 = 7 x 8 = 7 x 5 = 7 x 1 = 7 x 4 =

7 x 3 =

7 x 9 = 7 x 2 =

7 x 7 =

7 x 10 =

Task 5: Math Game

- With a deck of cards, flip a card. Whoever calls out the answer to the card x 7 first wins the card.
- Roll a die. Whoever shouts the answer to the die x7 gets a point. Shout a wrong answer and you subtract two points.

# **Progress Checklist**

As you demonstrate mastery of a timetable, cross it off your list! Remember to cross it off horizontally and vertically!

	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

# **Diagnostic Checklist**

Before beginning test student on each fact to see where they are starting!

	0	1	2	3	4	5	6	7	8	9	10
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

# **Diagnostic Checklist**

Before beginning test student on each fact to see where they are starting!

Question # Key

	0	1	2	3	4	5	6	7	8	9	10
0	66	64	61	57	52	46	39	31	22	12	1
1		62	58	53	47	40	32	23	13	2	11
2			54	48	41	33	24	14	3	10	21
3				42	34	25	15	4	9	20	30
4					26	16	5	8	19	29	38
5						6	7	18	28	37	45
6							17	27	36	44	51
7								35	43	50	56
8									49	55	60
9										59	63
10											65

# TimeTable Diagnostic

1. 10 x 0	2. 9 x 1	3. 8 x 2	4. 7 x 3		
5. 6x4	6. 5 x 5	7. 6 x 5	8. 7 x 4		
9. 8 x 3	10. 9 x 2	11. 10 x 1	12. 9 x 0		
13. 8 x 1	14. 7 x 2	15. 6 x 3	16. 5 x 4		
17. 6 x 6	18. 7 x 5	19. 8 x 4	20. 9 x 3		
21. 10 x 2	22. 8 x 0	23. 7 x 1	24. 6 x 2		
25. 5 x 3	26. 4 x 4	27. 7 x 6	28. 8 x 5		
29. 9 x 4	30. 10 x 3	31. 7 x 0	32. 6 x 1		
33. 5 x 2	34. 4 x 3	35. 7 x 7	36. 8 x 6		
37. 9 x 5	38. 10 x 4	39. 6 x 0	40. 5 x 1		
41. 4 x 2	42. 3 x 3	43. 8 x 7	44. 9 x 6		
45. 10 x 5	46. 5 x 0	47. 4 x 1	48. 3 x 2		
49. 8 x 8	50. 9 x 7	51. 10 x 6	52. 4 x 0		
53. 3 x 1	54. 2 x 2	55. 9 x 8	56. 10 x 7		
57. 3 x 0	58. 2 x 1	59. 9 x 9	60. 8 x 10		
61. 2 x 0	62. 1 x 1	63. 9 x 10	64. 1 x 0		
65. 10 x 10	66. 0 x 0	67.	68.		

# TimeTable Diagnostic

1.	2.	3.	4.
5.	6.	7.	8.
9.	10.	11.	12.
13.	14.	15.	16.
17.	18.	19.	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.
49.	50.	51.	52.
53.	54.	55.	56.
57.	58.	59.	60.
61.	62.	63.	64.
65.	66.	67.	68.

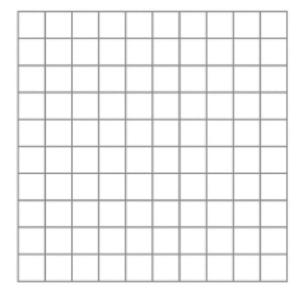
# **POST-Fluency Practice Checklist**

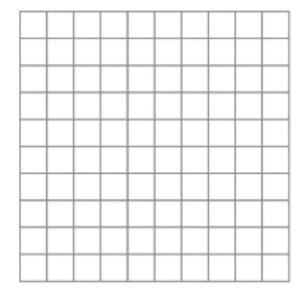
	0	1	2	3	4	5	6	7	8	9	10
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

# **Multiplication Chart**

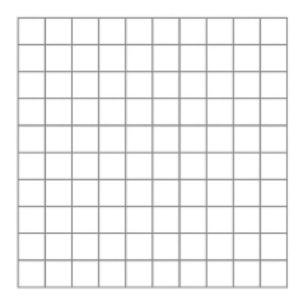
	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

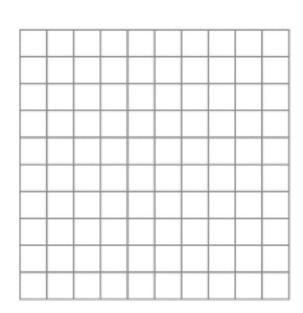
# **Area Game Grids**





Total: Total:





Total: Total: