

Dear Saratoga Central Catholic Family,

My name is Dorothy Schutter, and I will be teaching sixth grade Math this year. This year will be my twenty-third year at Saratoga Central Catholic and forty-eighth year in the classroom. I was a middle school math teacher for over twenty years, but most recently have been teaching upper-level students. I am so excited to teach sixth grade once again!

Students in sixth grade will be able to use a calculator but not until the second semester. Entering sixth grade with a mastery of MULTIPLICATION FACTS will help them move more easily through various levels of understanding and mastery of sixth grade concepts. Freeing up working memory allows students to develop their reasoning skills.

I have put together a packet focusing on the 6-7-8-9 multiplication facts. The activities in this packet are repetitive and most are meant to encourage students to count by 6s, 7s, 8s, 9s in order to complete meaningful tasks. These activities are meant to be a help for your sixth grader as they enter sixth grade. These activities are optional.

The following are four strategies that have been shown to help students with memorization of multiplication facts:

(1). Intensive repetitive focus on just one set of multiples, until mastered, is exactly what is needed for students who struggle with their multiplication facts.

(2). Engaging the fine motor system by writing the multiplication facts repeatedly has been shown to have positive effects on learning and memory.

(3). Understanding the correlation between adding repeatedly by the same number and multiplying by that number is essential.

(4). Chanting the multiplication facts

If you have any questions, you may contact me at

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Ms. Schutter

## Discovering Patterns in Multiples of 6

- Highlight all multiples of 2 (even numbers) in yellow
- Highlight all multiples of 3 in blue
- Circle all multiples of 6

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	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

What do you notice about multiples of 6? (come up with at least 3 ideas)

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## Multiples of 6: Which multiple does not belong?

- |    |    |    |
|----|----|----|
| 60 | 54 | 36 |
| 30 | 48 | 24 |
| 42 | 39 | 72 |
- |    |    |    |
|----|----|----|
| 66 | 24 | 60 |
| 36 | 45 | 12 |
| 24 | 72 | 42 |
- |    |    |    |
|----|----|----|
| 54 | 78 | 30 |
| 60 | 24 | 66 |
| 48 | 34 | 42 |
- |    |    |    |
|----|----|----|
| 42 | 66 | 36 |
| 60 | 48 | 84 |
| 54 | 18 | 69 |
- |    |    |    |
|----|----|----|
| 24 | 28 | 42 |
| 66 | 36 | 18 |
| 48 | 60 | 72 |
- |    |    |    |
|----|----|----|
| 54 | 24 | 18 |
| 30 | 32 | 48 |
| 36 | 42 | 60 |
- |    |    |    |
|----|----|----|
| 24 | 12 | 54 |
| 63 | 48 | 72 |
| 66 | 54 | 36 |
- |    |    |    |
|----|----|----|
| 42 | 72 | 36 |
| 24 | 52 | 66 |
| 54 | 48 | 30 |
- |    |    |    |
|----|----|----|
| 48 | 72 | 30 |
| 42 | 54 | 66 |
| 60 | 16 | 36 |
- |    |    |    |
|----|----|----|
| 72 | 36 | 40 |
| 24 | 42 | 48 |
| 66 | 30 | 12 |
- |    |    |    |
|----|----|----|
| 24 | 66 | 30 |
| 54 | 24 | 60 |
| 36 | 66 | 26 |
- |    |    |    |
|----|----|----|
| 42 | 66 | 36 |
| 60 | 48 | 84 |
| 54 | 18 | 69 |
- |    |    |    |
|----|----|----|
| 24 | 66 | 30 |
| 54 | 48 | 60 |
| 20 | 36 | 42 |

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**Multiples of 6:  
Which multiple does not belong?  
Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 6's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

1.

60	54	36
30	48	24
42	39	72

6 x 10		

My Number Sense Explanation:

2.

66	24	60
36	45	12
24	72	42


My Number Sense Explanation:

**Multiples of 6:  
Which multiple does not belong?  
Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 6's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

3.

54	78	30
60	24	66
48	34	42


My Number Sense Explanation:

4.

42	66	36
60	48	84
54	18	69


My Number Sense Explanation:

**Multiples of 6:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 6's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

5.

24	28	42
66	36	18
48	60	72


My Number Sense Explanation:

6.

54	24	18
30	32	48
36	42	60


My Number Sense Explanation:

**Multiples of 6:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 6's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

7.

24	12	54
63	48	72
66	54	36


My Number Sense Explanation:

8.

42	72	36
24	52	66
54	48	30


My Number Sense Explanation:

**Multiples of 6:  
Which multiple does not belong?  
Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 6's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

9.

48	72	30
42	54	66
60	16	36


My Number Sense Explanation:

10.

72	36	40
24	42	48
66	30	12


My Number Sense Explanation:

**Multiples of 6:  
Which multiple does not belong?  
Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 6's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

11.

66	72	30
54	24	60
36	66	26


My Number Sense Explanation:

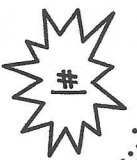
12.

24	66	30
54	48	60
20	36	42


My Number Sense Explanation:

## Find the Missing Multiple of 6

Each box should contain the products of your 6 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

6	60	24
	36	18
66	12	48
30	72	42

4.

18	12	24
42	72	30
66	6	60
54		36

2.

36	6	60
48		66
18	30	12
72	24	54

5.

24	6	48
30	36	66
12	60	18
	42	54

3.

48	42	54
36	6	66
12	72	18
	30	24

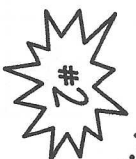
6.

60	42	54
6	24	66
30	72	12
36		18

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## Find the Missing Multiple of 6

Each box should contain the products of your 6 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

48	42	
18	66	24
6	12	60
72	30	54

4.

30	6	24
42	48	18
12	66	54
60		36

2.

72	12	48
6		60
24	66	42
30	36	18

5.

6	30	
18	24	60
48	42	12
72	66	54

3.

12	30	36
72	24	18
48	66	42
6		54

6.

6		42
48	24	72
60	12	18
36	66	54

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## Find the Missing Multiple of 6: Larger Multiples

Challenge

These "Missing Multiple" boxes use larger multiples of 6. Figure out the multiple that is missing in the sequence. You may NOT use the multiple that comes before the LOWEST multiple in the chart. (Example: If 24 is the lowest number, your answer will not be 18).

1.

42	48	30
72	18	36
60	24	
78	66	54

2.

42	84	
72	60	78
54	96	48
90	30	36

3.

30		78
48	36	72
42	60	66
96	90	84

4.

24	60	90
48	30	84
36	78	54
	66	42

5.

24	66	72
30	54	36
60	18	48
78	84	

6.

42	72	60
84	36	66
54	78	24
	48	30

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## Multiples of 6 Search

Begin with 6 and follow multiples of 6 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 72.

This Multiple Search has 3 solutions. Find them all!

66	72	36	72	48	36	48	6
6	60	54	54	66	42	48	66
36	12	6	48	30	60	6	42
66	54	18	6	42	12	12	66
24	72	24	60	36	24	18	48
72	30	54	30	12	12	30	54
72	60	30	48	60	36	30	42
66	36	24	42	42	48	12	18
48	42	30	18	12	36	42	48
18	48	54	6	18	6	18	72
66	54	60	66	30	72	24	66
54	72	42	24	72	18	54	24



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## Multiples of 6 Search

Begin with 6 and follow multiples of 6 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 72.



This Multiple Search has 3 solutions. Find them all!

66	36	72	30	60	54	48	42
6	18	12	66	48	6	36	12
36	60	42	24	12	30	48	60
66	12	30	18	54	24	18	42
24	24	24	48	12	6	12	12
72	12	30	36	54	36	42	48
72	36	36	42	30	6	18	72
66	42	24	48	42	24	54	6
48	48	30	54	48	66	18	54
18	42	54	60	60	12	42	24
66	66	60	42	66	72	6	42
72	72	42	24	72	18	54	24



# Discovering Patterns in Multiples of 7

Highlight all multiples of 7

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	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

What do you notice about multiples of 7? (come up with at least 3 ideas)

## Multiples of 7: Which multiple does not belong?

- |    |    |    |
|----|----|----|
| 70 | 63 | 42 |
| 35 | 56 | 28 |
| 49 | 26 | 84 |
- |    |    |    |
|----|----|----|
| 77 | 28 | 70 |
| 42 | 45 | 14 |
| 21 | 84 | 49 |
- |    |    |    |
|----|----|----|
| 63 | 91 | 35 |
| 70 | 28 | 77 |
| 56 | 34 | 49 |
- |    |    |    |
|----|----|----|
| 49 | 77 | 42 |
| 70 | 56 | 98 |
| 63 | 21 | 62 |
- |    |    |    |
|----|----|----|
| 28 | 29 | 49 |
| 77 | 42 | 21 |
| 56 | 70 | 84 |
- |    |    |    |
|----|----|----|
| 63 | 28 | 21 |
| 35 | 32 | 56 |
| 42 | 49 | 70 |
- |    |    |    |
|----|----|----|
| 28 | 14 | 63 |
| 60 | 56 | 84 |
| 77 | 21 | 42 |
- |    |    |    |
|----|----|----|
| 49 | 84 | 42 |
| 28 | 52 | 77 |
| 63 | 56 | 35 |
- |    |    |    |
|----|----|----|
| 56 | 84 | 35 |
| 49 | 63 | 77 |
| 70 | 13 | 42 |
- |    |    |    |
|----|----|----|
| 84 | 42 | 25 |
| 28 | 49 | 56 |
| 77 | 35 | 14 |
- |    |    |    |
|----|----|----|
| 77 | 84 | 35 |
| 63 | 28 | 91 |
| 42 | 66 | 21 |
- |    |    |    |
|----|----|----|
| 28 | 77 | 35 |
| 63 | 56 | 70 |
| 20 | 42 | 49 |

**Multiples of 7:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 7's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

70	63	42
35	56	28
49	26	84

7 × 10		

My Number Sense Explanation:

2.

77	28	70
42	45	14
21	84	49


My Number Sense Explanation:

**Multiples of 7:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 7's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

63	91	35
70	28	77
56	34	49


My Number Sense Explanation:

4.

49	77	42
70	56	98
63	21	62


My Number Sense Explanation:

**Multiples of 7:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 7's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

5.

28	29	49
77	42	21
56	70	84


My Number Sense Explanation:

6.

63	28	21
35	32	56
42	49	70


My Number Sense Explanation:

**Multiples of 7:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 7's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

7.

28	14	63
60	56	84
77	21	42


My Number Sense Explanation:

8.

49	84	42
28	52	77
63	56	35


My Number Sense Explanation:

**Multiples of 7:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 7's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

9.

56	84	35
49	63	77
70	13	42


My Number Sense Explanation:

10.

84	42	25
28	49	56
77	35	14


My Number Sense Explanation:

**Multiples of 7:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 7's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

11.

77	84	35
63	28	91
42	66	21


My Number Sense Explanation:

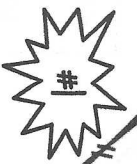
12.

28	77	35
63	56	70
20	42	49


My Number Sense Explanation:

## Find the Missing Multiple of 7

Each box should contain the products of your 7 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

7	70	28
	42	21
77	14	56
35	84	49

2.

42	7	70
56		77
21	35	14
84	28	63

3.

56	49	63
42	7	77
14	84	21
	35	70

4.

21	14	28
49	84	35
77	7	70
63		42

5.

28	7	56
35	42	77
14	70	21
	49	63

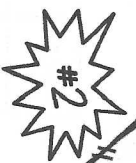
6.

70	49	63
7	28	77
35	84	14
56		21

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## Find the Missing Multiple of 7

Each box should contain the products of your 7 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

56	49	
21	77	28
7	14	70
84	35	63

2.

84	14	56
7		70
28	77	49
35	42	21

3.

14	35	42
84	28	21
56	77	49
7		63

4.

35	7	28
49	56	21
14	77	63
70		42

5.

7	35	
21	28	70
56	49	14
84	77	63

6.

7		49
56	28	84
70	14	21
42	77	63

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## Find the Missing Multiple of 7: Larger Multiples

Challenge

These 'Missing Multiple' boxes use larger multiples of 7. Figure out the multiple that is missing in the sequence. You may NOT use the multiple that comes before the LOWEST multiple in the chart. (Example: If 28 is the lowest number, your answer will not be 21).

1.

49	56	35
84	21	42
70	28	
91	77	63

4.

28	70	105
56	35	98
42	91	63
	77	49

2.

49	98	
84	70	91
63	112	56
105	35	42

5.

28	77	84
35	63	42
70	21	56
91	98	

3.

35		91
56	42	84
49	70	77
112	105	98

6.

49	84	70
98	42	77
63	91	28
	21	35

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## Multiples of 7 Search

Begin with 7 and follow multiples of 7 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 84.

This Multiple Search has 3 solutions. Find them all!

77	84	42	84	56	42	56	7
7	70	63	63	77	49	56	77
42	14	7	56	35	70	7	49
77	63	21	7	49	14	14	77
28	84	28	70	42	28	21	56
84	35	63	35	14	14	35	63
84	70	35	56	70	42	35	49
77	42	28	49	49	56	14	21
56	49	35	21	14	42	49	56
21	56	63	7	21	7	21	84
77	63	70	77	35	84	28	77
63	84	49	28	84	21	63	28

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## Multiples of 7 Search

Begin with 7 and follow multiples of 7 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 84.



This Multiple Search has 3 solutions. Find them all!

77	42	84	35	70	63	56	49
7	21	14	77	56	7	42	14
42	70	49	28	14	35	56	70
77	14	35	21	63	28	21	49
28	28	28	56	14	7	14	14
84	14	35	42	63	42	49	56
84	42	42	49	35	7	21	84
77	49	28	56	49	28	63	7
56	56	35	63	56	77	21	63
21	49	63	70	70	14	49	28
77	77	70	49	77	84	7	49
84	84	49	28	84	21	63	28

# Discovering Patterns in Multiples of 8

Highlight all multiples of 8

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	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

What do you notice about multiples of 8? (come up with at least 3 ideas)

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## Multiples of 8: Which multiple does not belong?

- |    |    |    |
|----|----|----|
| 80 | 72 | 48 |
| 40 | 64 | 32 |
| 16 | 28 | 96 |
- |    |    |    |
|----|----|----|
| 88 | 32 | 80 |
| 48 | 45 | 16 |
| 24 | 96 | 64 |
- |    |    |    |
|----|----|----|
| 72 | 56 | 40 |
| 80 | 32 | 88 |
| 64 | 34 | 24 |
- |    |    |     |
|----|----|-----|
| 64 | 88 | 48  |
| 80 | 16 | 112 |
| 72 | 24 | 62  |
- |    |    |    |
|----|----|----|
| 32 | 30 | 64 |
| 88 | 48 | 24 |
| 16 | 80 | 96 |
- |    |    |    |
|----|----|----|
| 72 | 32 | 24 |
| 40 | 58 | 64 |
| 48 | 16 | 80 |
- |    |    |    |
|----|----|----|
| 32 | 16 | 56 |
| 60 | 64 | 96 |
| 88 | 72 | 48 |
- |    |    |    |
|----|----|----|
| 64 | 96 | 48 |
| 32 | 52 | 88 |
| 72 | 24 | 40 |
- |    |    |     |
|----|----|-----|
| 64 | 88 | 48  |
| 80 | 16 | 112 |
| 72 | 24 | 62  |
- |    |    |    |
|----|----|----|
| 96 | 48 | 25 |
| 32 | 64 | 24 |
| 88 | 40 | 16 |
- |    |    |    |
|----|----|----|
| 88 | 96 | 40 |
| 72 | 32 | 64 |
| 48 | 66 | 24 |
- |    |    |    |
|----|----|----|
| 32 | 88 | 40 |
| 72 | 24 | 80 |
| 20 | 48 | 64 |

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**Multiples of 8:  
Which multiple does not belong?  
Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 8's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

80	72	48
40	64	32
16	28	96

8 x 10			

My Number Sense Explanation:

2.

88	32	80
48	45	16
24	96	64


My Number Sense Explanation:

**Multiples of 8:  
Which multiple does not belong?  
Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 8's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

72	56	40
80	32	88
64	34	24


My Number Sense Explanation:

4.

64	88	48
80	16	112
72	24	62


My Number Sense Explanation:

**Multiples of 8:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 8's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

32	30	64
88	48	24
16	80	96


My Number Sense Explanation:

6.

72	32	24
40	58	64
48	16	80


My Number Sense Explanation:

**Multiples of 8:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 8's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

32	16	56
60	64	96
88	72	48


My Number Sense Explanation:

8.

64	96	48
32	52	88
72	24	40


My Number Sense Explanation:

**Multiples of 8:**  
Which multiple does not belong?  
Extend Your Thinking

Circle the multiple that does not belong. Next, record the 8's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

9.

64	24	40
16	72	88
80	18	48


My Number Sense Explanation:

10.

96	48	25
32	64	24
88	40	16


My Number Sense Explanation:

**Multiples of 8:**  
Which multiple does not belong?  
Extend Your Thinking

Circle the multiple that does not belong. Next, record the 8's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

11.

88	96	40
72	32	64
48	66	24


My Number Sense Explanation:

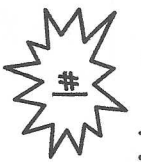
12.

32	88	40
72	24	80
20	48	64


My Number Sense Explanation:

## Find the Missing Multiple of 8

Each box should contain the products of your 8 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

8	80	32
	48	24
88	16	56
40	96	64

2.

48	8	80
56		88
24	40	16
96	32	72

3.

64	56	72
48	8	32
16	96	24
	40	80

4.

24	16	32
64	96	40
88	8	80
72		48

5.

32	8	56
40	48	88
16	80	24
	64	72

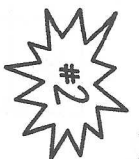
6.

48	64	72
8	32	88
40	96	16
56		24

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## Find the Missing Multiple of 8

Each box should contain the products of your 8 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

64	56	
24	88	32
8	16	80
96	40	72

2.

96	16	64
8		80
32	88	56
40	48	24

3.

16	40	48
96	32	24
56	88	64
8		72

4.

40	8	32
56	64	24
16	88	72
80		48

5.

8	40	
24	32	80
64	56	16
96	48	72

6.

8		56
64	32	96
80	16	24
48	88	72

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## Find the Missing Multiple of 8: Larger Multiples

These "Missing Multiple" boxes use larger multiples of 8. Figure out the multiple that is missing in the sequence. You may NOT use the multiple that comes before the LOWEST multiple in the chart. (Example: If 32 is the lowest number, your answer will not be 24).

Challenge

1.

56	64	40
96	24	48
80	32	
104	88	72

2.

64	112	
96	80	104
72	32	56
120	40	48

3.

40		104
64	48	96
56	80	88
32	120	112

4.

32	80	120
64	40	112
48	104	72
	88	56

5.

32	88	64
40	72	48
80	24	56
96	112	

6.

56	64	80
112	48	88
72	104	32
	24	40

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## Multiples of 8 Search

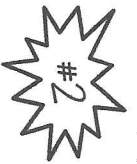
Begin with 8 and follow multiples of 8 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 96.

This Multiple Search has 3 solutions. Find them all!

88	96	48	96	64	24	16	8
8	80	72	72	32	96	88	80
48	16	8	40	40	80	72	64
88	72	24	48	56	64	16	96
32	96	32	80	48	32	88	64
48	40	72	40	16	80	40	72
56	80	40	96	80	48	72	64
64	48	88	64	64	64	16	64
72	80	40	24	16	48	56	64
24	64	72	8	24	8	48	96
88	72	80	88	32	40	32	88
72	96	64	32	96	24	72	32

## Multiples of 8 Search

Begin with 8 and follow multiples of 8 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 96.



This Multiple Search has 3 solutions. Find them all!

96	48	96	40	64	72	64	64
8	88	16	72	64	56	48	16
48	80	80	32	16	8	48	40
88	16	40	24	72	16	24	32
32	24	32	40	16	8	16	16
96	16	40	48	72	48	64	64
96	8	48	64	56	64	72	96
88	64	32	64	64	32	72	80
64	64	40	56	48	88	88	72
24	64	64	80	40	16	64	96
88	80	72	8	32	96	8	64
96	96	16	24	96	24	72	32

# Discovering Patterns in Multiples of 9

Highlight all multiples of 9

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	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

What do you notice about multiples of 9? (come up with at least 3 ideas)

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## Multiples of 9: Which multiple does not belong?

1.	90	81	54
	45	72	36
	18	28	108

2.	99	36	90
	54	30	18
	27	108	81

3.	81	117	45
	90	36	99
	72	46	18

4.	81	99	54
	90	72	36
	18	27	62

5.	36	39	81
	99	54	27
	72	90	108

6.	81	36	27
	45	32	72
	54	18	90

7.	36	18	81
	60	72	108
	99	27	54

8.	18	108	54
	36	52	99
	81	72	45

9.	72	108	45
	18	81	99
	90	15	54

10.	108	54	49
	36	81	72
	99	45	18

11.	99	18	45
	81	36	63
	54	66	27

12.	36	99	45
	81	72	90
	56	54	18

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**Multiples of 9:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 9's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

1.

90	81	54
45	72	36
18	28	108

9 x 10		

My Number Sense Explanation:

2.

99	36	90
54	30	18
27	108	81


My Number Sense Explanation:

**Multiples of 9:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 9's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

3.

81	117	45
90	36	99
72	46	18


My Number Sense Explanation:

4.

81	99	54
90	72	36
18	27	62


My Number Sense Explanation:



**Multiples of 9:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 9's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

36	39	81
99	54	27
72	90	108


My Number Sense Explanation:

6.

81	36	27
45	32	72
54	18	90


My Number Sense Explanation:

**Multiples of 9:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the 9's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

36	18	81
60	72	108
99	27	54


My Number Sense Explanation:

8.

18	108	54
36	52	99
81	72	45


My Number Sense Explanation:

**Multiples of q:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the q's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

9.

72	108	45
18	81	99
90	15	54


My Number Sense Explanation:

10.

108	54	49
36	81	72
99	45	18


My Number Sense Explanation:

**Multiples of q:**  
**Which multiple does not belong?**  
**Extend Your Thinking**

Circle the multiple that does not belong. Next, record the q's multiplication fact for each of the other numbers in the chart. Then, using your "number sense," explain your reasoning for the number that does not belong in as many ways as you can.

11.

99	18	45
81	36	63
54	66	27


My Number Sense Explanation:

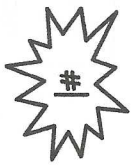
12.

36	99	45
81	72	90
56	54	18


My Number Sense Explanation:

## Find the Missing Multiple of 9

Each box should contain the products of your 9 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

9	90	36
	54	27
99	18	72
45	108	81

4.

27	18	36
81	108	45
99	9	90
63		54

2.

54	9	90
72		99
27	45	18
108	36	63

5.

36	9	72
45	54	99
18	90	27
	63	81

3.

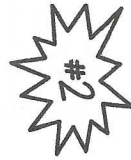
72	63	81
36	9	99
18	108	27
	45	90

6.

90	81	63
9	36	54
45	108	18
72		27

## Find the Missing Multiple of 9

Each box should contain the products of your 9 times tables from 1-12. Figure out the missing multiple and record it in the empty box.



1.

72	81	
27	99	36
9	18	90
108	45	63

4.

45	9	36
81	72	27
18	99	63
90		54

2.

108	18	72
9		90
36	99	81
45	54	27

5.

9	45	
27	36	90
72	63	18
108	99	81

3.

18	45	54
108	36	27
72	99	81
9		63

6.

9		63
72	36	108
90	18	27
54	99	81

## Find the Missing Multiple of 9: Larger Multiples

Challenge

These "Missing Multiple" boxes use larger multiples of 9. Figure out the multiple that is missing in the sequence. You may NOT use the multiple that comes before the LOWEST multiple in the chart. (Example: If 36 is the lowest number, your answer will not be 27).

1.

81	72	45
108	27	54
90	36	
117	99	63

4.

36	90	135
72	45	126
54	117	81
	99	63

2.

81	126	
108	90	117
63	36	72
135	45	54

5.

36	99	108
45	63	54
90	27	72
117	126	

3.

45		117
81	54	108
63	90	99
135	36	126

6.

81	108	90
126	54	99
63	117	36
	27	45

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## Multiples of 9 Search

Begin with 9 and follow multiples of 9 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 108.

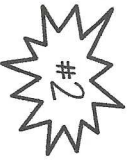
This Multiple Search has 3 solutions. Find them all!

9	63	108	99	36	9	45	99
18	27	9	90	108	27	45	36
9	36	63	81	54	63	54	27
45	18	72	54	18	63	72	18
81	63	81	81	72	9	9	54
18	54	27	81	90	99	108	18
72	72	45	45	54	36	18	72
81	63	27	36	27	9	72	18
90	18	54	81	54	18	54	18
99	27	9	45	9	27	36	45
72	108	36	81	72	9	18	99
27	72	54	63	45	108	90	27

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## Multiples of 9 Search

Begin with 9 and follow multiples of 9 (by connecting numbers to the left, right, above, below, or diagonally) until you reach 108.



This Multiple Search has 3 solutions. Find them all!

9	81	63	36	27	72	63	45
54	108	45	54	63	18	27	18
27	90	81	72	81	27	9	63
108	45	99	45	108	9	9	27
36	9	72	108	72	81	63	81
18	45	54	63	72	90	18	18
27	36	99	90	99	108	45	108
81	27	18	108	18	36	9	54
99	18	9	18	27	27	63	27
18	9	63	90	81	72	108	99
108	36	36	99	54	63	54	45
45	18	90	108	9	27	18	27