

# DEVELOPING COMPUTATIONAL FLUENCY THROUGH NUMBER SENSE

## PROFESSIONAL DEVELOPMENT MODULE

Dr. Calvin Irons  
Dr. Sandra L. Atkins  
James Burnett

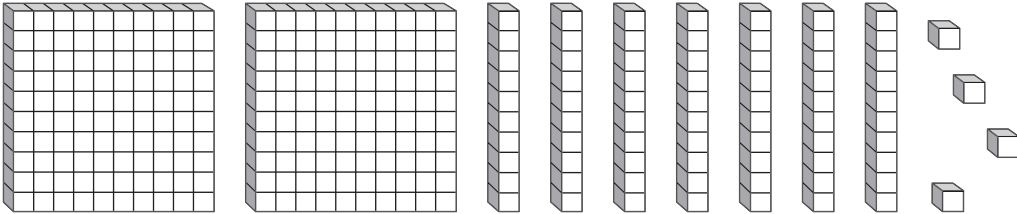
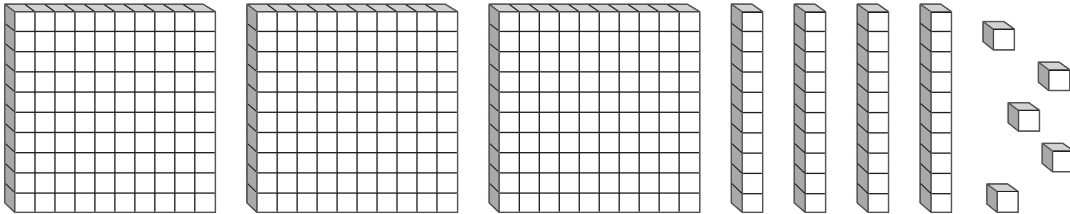
*Students who are computationally fluent  
are able to compute quickly and accurately  
using a variety of methods and tools.*

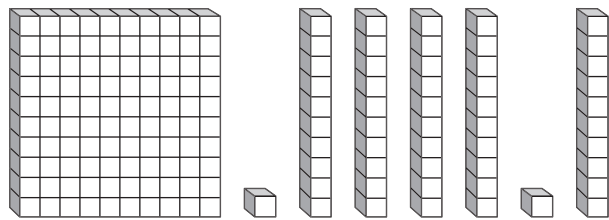
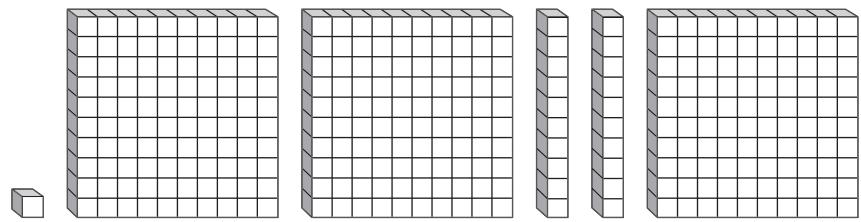
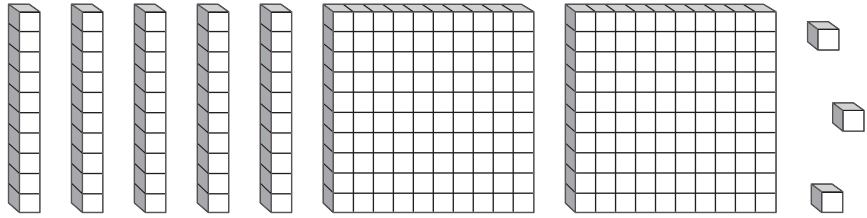

# Subitizing

## Visual Memory Activity

**Materials:** Copy the base-10 pictures below and on the facing page onto overhead transparencies.

**Instructions:** Show each picture on the projector, one at a time by turning the projector on and off quickly. If needed, show the picture again by quickly turning the projector on and off. Ask the students to tell the quantity shown and how they know.





## Computational Strategies

- ★ Count on/ Count back 1, 2, 3
- ★ Use “Skip Counting”—Add or subtract 100s, 10s, 1s
- ★ Make 1000s, 100s, 10s
- ★ Doubles/Near Doubles
- ★ Compensation
- ★ Use halving and doubling
- ★ Break problem up into simpler problems  
(leads to distributive property)
- ★ Use benchmarks
- ★ Work left to right

# Count On/Count Back 1, 2

## Fill Five


# Count On/Count Back 1, 2

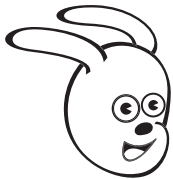
## WARM UP +1

Gemma had \$5. Her mother gave her \$1 more. How much money does she have?



1. Write the number fact.

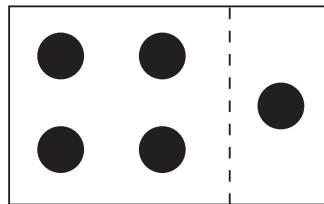
$$\underline{5} + \underline{\quad} = \underline{\quad}$$



How did you figure it out in your head?

2. Look at this count-on card. Complete the number fact.

$$\underline{4} + \underline{1} = \underline{\quad}$$



3. Write a number fact for each of these. Write the turnaround fact.

a.

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

b.

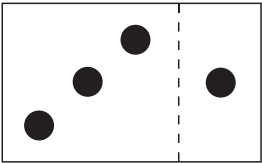
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

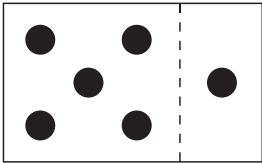
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

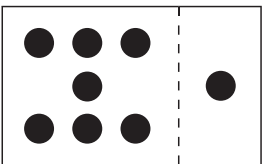
# Count On/Count Back 1, 2

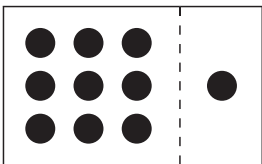
## WORK OUT 1

1. Write a number fact to show each total.

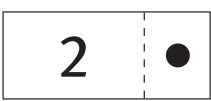
a.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$


b.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$


c.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$


d.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

2. Write the number fact then write the turnaround fact.

a.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

b.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

c.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

d.   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$   
 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

## Skip Counting

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

# Skip Counting


# Skip Counting

7

Here is a **chunk** of a hundred chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

This is a **piece** of the same chart.

	C			
		B		
	A	76	77	
D				E

Write the numbers that belong at A, B, C, D, and E.

Computation and Number Sense

© ORIGO Publications

Grade 2



Orange Tank

Burnett, J. (2005). *The Think Tank. Orange Level.* San Ramon, CA: ORIGO Publications.

2

Here is a **chunk** of a hundred chart.

301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320

Here are some **pieces** of the same chart.

321									
		346							
			379						
						317			
							305		
	A	B	C	D				E	

Write the numbers that belong at A, B, C, D, and E.

Computation and Number Sense

© ORIGO Publications

Grade 4



Green Tank

Burnett, J. (2005). *The Think Tank. Green Level.* San Ramon, CA: ORIGO Publications.

# Skip Counting

11

Grade 6

Here is a **chunk** of a hundred chart.

.11	.12	.13	.14	.15	.16	.17	.18	.19	.2
.21	.22	.23	.24	.25	.26	.27	.28	.29	.3

This is a **piece** of the same chart.

A			
	B		C
		.46	
			E
D			

Write the numbers that belong at A, B, C, D, and E.

Computation and Number Sense

© ORIGO Publications

Blue Tank



**QUICK  
THINKERS**

Burnett, J. (2005). *The Think Tank. Blue Level*. San Ramon, CA: ORIGO Publications.

**Briefly describe the ways in which you used skip counting to solve these problems.**

**When could you use these in your current curriculum?**

**Modifications:**

**Additional notes:**


# Skip Counting

## WARM UP + 5

It took Calvin 26 minutes to walk to the store and 30 minutes to walk back. How many minutes did he walk?



1. a. Use this counting board to help you figure out the total.



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

- b. Draw arrows on the board to show what you did.
- c. Write a matching number sentence.

_____	+	_____	=	_____
-------	---	-------	---	-------

2. Look at this counting board.

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

Write a number sentence to show what has happened.

_____	+	_____	=	_____
-------	---	-------	---	-------

# Skip Counting

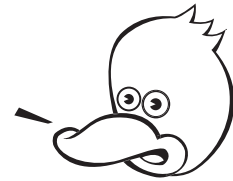
## WARM UP 3

1. Look at this counting board.
  - a. Place a counter on 224. Move it forward 35 spaces.

211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260

- b. Draw arrows on the board to show how you added 35.
- c. Write a number sentence to match what you did.

224 + \_\_\_\_\_



- d. Use a different color to show another way to add 35.

2. Look at this counting board.

211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260

- a. Complete this number sentence to show what has happened.

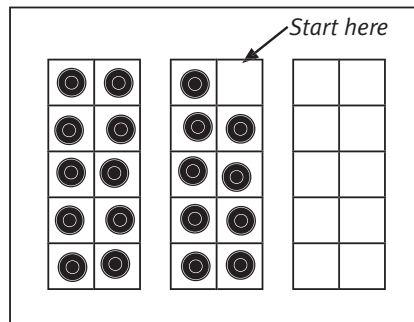
\_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_

- b. Draw more arrows to show another way to add 42.

# Make 1000s, 100s, 10s



# Make 1000s, 100s, 10s



Draw 7 more

$$\begin{array}{r} 19 \\ \hline \end{array} + \underline{\quad\quad}$$
**is the same as**  

$$\underline{20} + \underline{\quad\quad} = \underline{\quad\quad}$$

Draw 6 more

$$\begin{array}{r} 29 \\ \hline \end{array} + \underline{\quad\quad}$$
**is the same as**  

$$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

For each of these, draw an arrow to a number sentence below that has the same answer. Write the answer.

- a.  $29 + 8$     b.  $58 + 3$     c.  $28 + 7$     d.  $59 + 5$

$30 + 5 = \underline{\quad\quad}$

$30 + 7 = \underline{\quad\quad}$

$60 + 4 = \underline{\quad\quad}$

$60 + 1 = \underline{\quad\quad}$

# First to Forty





Make 1000s, 100s, 10s

# Make 100

Tens	Ones	Total

Tens	Ones	Total

Tens	Ones	Total

Tens	Ones	Total

Tens	Ones	Total

Tens	Ones	Total

**Make 1000s, 100s, 10s**

# Target 10

Ones	Tenths	Total

Ones	Tenths	Total

Ones	Tenths	Total

Ones	Tenths	Total

Ones	Tenths	Total

Ones	Tenths	Total

Make 1000s, 100s, 10s

# Target One

Tenths	Hundredths	Total

Tenths	Hundredths	Total

Tenths	Hundredths	Total

Tenths	Hundredths	Total

Tenths	Hundredths	Total

Tenths	Hundredths	Total

# Make 1000s, 100s, 10s

18

Write a **short story problem** that uses these numbers.

100      10

Computation and Number Sense

© ORIGO Publications

Grade 2



Orange Tank

Burnett, J. (2005). *The Think Tank. Orange Level.* San Ramon, CA: ORIGO Publications.

2

Copy and complete these.  
**Make each one different.**

$$\underline{\quad} + \underline{\quad} = 100$$

$$\underline{\quad} + \underline{\quad} = 100$$

$$\underline{\quad} + \underline{\quad} = 100$$

$$\underline{\quad} + \underline{\quad} = 100$$

$$\underline{\quad} + \underline{\quad} = 100$$

$$\underline{\quad} + \underline{\quad} = 100$$

Computation and Number Sense

© ORIGO Publications

Grade 3



Purple Tank

Burnett, J. (2005). *The Think Tank. Purple Level.* San Ramon, CA: ORIGO Publications.

## Make 1000s, 100s, 10s

12

Grade 4

Add any two of these numbers **in your head**.

349

251

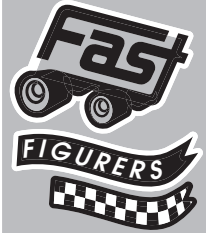
199

250

- a. Copy and complete this number sentence to show your answer.

\_\_\_ + \_\_\_ = \_\_\_

- b. Describe the strategy you used to figure out the answer.



Computation and Number Sense

© ORIGO Publications

Green Tank

Burnett, J. (2005). *The Think Tank. Green Level*. San Ramon, CA: ORIGO Publications.

**Briefly describe the ways in which children use the strategy “Make 1000s, 100s, and 10s” to solve these problems.**

**When could you use these in your current curriculum?**

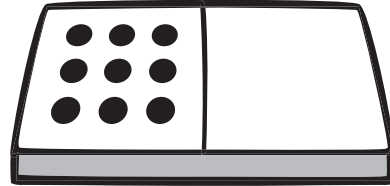
**Modifications:**

**Additional notes:**

# Doubles and Near Doubles

## WARM UP

1. Draw dots on this domino to show double 9.



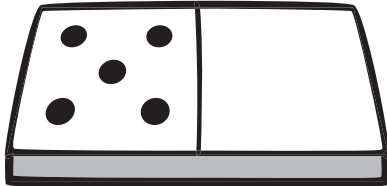
Write the number fact.

$$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$


How did you figure out double 9 in your head?

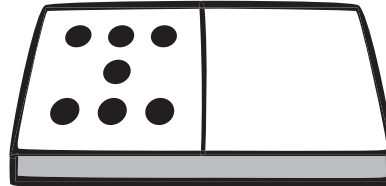
2. For each of these, draw dots to show a double.  
Write the double fact.

a.



$$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

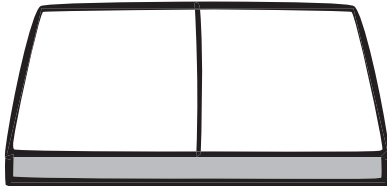
b.



$$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

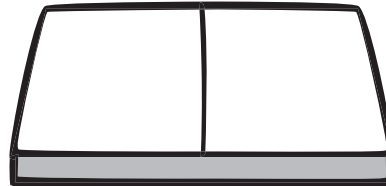
3. Draw dots to show the doubles that have these answers.  
Complete the number facts.

a.



$$\underline{\quad\quad} + \underline{\quad\quad} = 16$$

b.

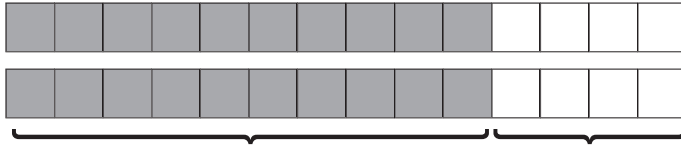


$$\underline{\quad\quad} + \underline{\quad\quad} = 8$$

# Doubles and Near Doubles

These cube trains show double 14.

Fill in the spaces below to describe the two parts.



a. Double \_\_\_\_\_

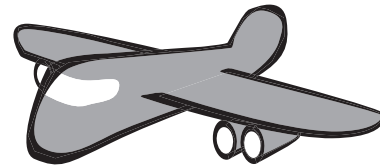
b. Double \_\_\_\_\_

Complete this sentence.

Double 14 is the same as double \_\_\_\_\_ plus double \_\_\_\_\_

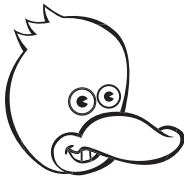
Burnett, J. (2003). *Mathementals 2. Developing Computational Fluency*. San Ramon, CA: ORIGO Publications.

**A one-way air ticket costs \$260.  
A return ticket costs double this amount.  
What does a return ticket cost?**



- a. Figure out the answer in your head.  
Write the number sentence.

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

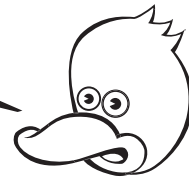


**How did you double 260?**

- b. Complete this sentence.

Double 260 is the same as double \_\_\_\_\_ plus double \_\_\_\_\_

**Think of another way  
you could double 260.**



- c. Complete this sentence to show another method.

Double 260 is the same as \_\_\_\_\_

Burnett, J. (2003). *Mathementals 4. Developing Computational Fluency*. San Ramon, CA: ORIGO Publications.

## Doubles and Near Doubles

### Double Up

6	16	10	8
12	10	14	6
16	14	12	14
8	8	12	8

## Doubles and Near Doubles

# Double Trouble

13	17	7
11	15	13
17	7	9
9	11	15





# Number Facts

## Teaching Facts Using a Number Sense Approach

Addition/Subtraction	
Addition	Subtraction
Count On 0, 1, 2	Count On/Count Back
Use Doubles	Use Doubles
Doubles + 1	Use Ten
Doubles + 2	Link above to addition ...
Use Ten	

<b>+</b>	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

# Cat and Mice

5		1		5		1
4	3	2	3	4	3	2
2	1	3	1	2	1	3
1	4	2	5	3	4	1
2	1	3	1	2	1	3
4	1	2	3	4	1	4
2	3	1		5	3	2
1 HOME	4 HOME	2 HOME	3 HOME	2 HOME	4 HOME	1 HOME

## Compensation

# Up or Down

90 - 15	95 - 20	90 - 25	95 - 30	90 - 35
80 - 15	85 - 20	80 - 25	85 - 30	80 - 35
70 - 15	75 - 20	70 - 25	75 - 30	70 - 35
60 - 15	65 - 20	60 - 25	65 - 30	60 - 35
50 - 15	55 - 20	50 - 25	55 - 30	50 - 35
40 - 15	45 - 20	40 - 25	45 - 30	40 - 35

# Up or Down Again

75	75	65	65	55
65	65	55	55	45
55	55	45	45	35
45	45	35	35	25
35	35	25	25	15
25	25	15	15	5

# Compensation

6

Grade 4

Look at this subtraction example.

$$67 - 22$$

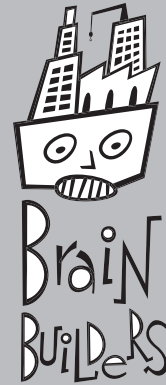
Which of these examples have the **same answer**?

- a.  $67 - 2 - 20$
- b.  $70 - 25$
- c.  $60 - 7 - 20 - 2$
- d.  $65 - 20$

Computation and Number Sense

© ORIGO Publications

Green Tank



Burnett, J. (2005). *The Think Tank. Green Level*. San Ramon, CA: ORIGO Publications.

9

Grade 5

Write  $<$  (is less than),  $=$  (is equal to), or  $>$  (is greater than) to make each of these true.

- a.  $89 - 37$  \_\_\_\_  $80 - 30 - 2$
- b.  $253 - 118$  \_\_\_\_  $255 - 120$
- c.  $\$20 - \$12.49$  \_\_\_\_  $\$20 - \$12 + 49c$
- d.  $500 - 365$  \_\_\_\_  $499 - 364$
- e.  $3.4 - 2.8$  \_\_\_\_  $2.8 - 3.4$

Computation and Number Sense

© ORIGO Publications

Red Tank



Burnett, J. (2005). *The Think Tank. Red Level*. San Ramon, CA: ORIGO Publications.

# Compensation

7

Grade 6

- a. Figure out the answer **in your head**.

$$5,600 - 1,900 = \underline{\hspace{2cm}}$$

- b. Write about the strategy you used.  
c. Write **four** other number sentences that you could solve the same way.



Computation and Number Sense

© ORIGO Publications

Blue Tank

Burnett, J. (2005). *The Think Tank. Blue Level*. San Ramon, CA: ORIGO Publications.

**Briefly describe the ways in which the compensation strategy can be used to solve these problems.**

**When could you use these in your current curriculum?**

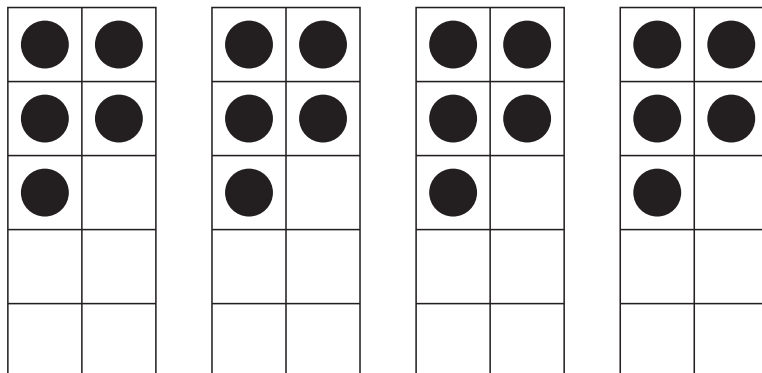
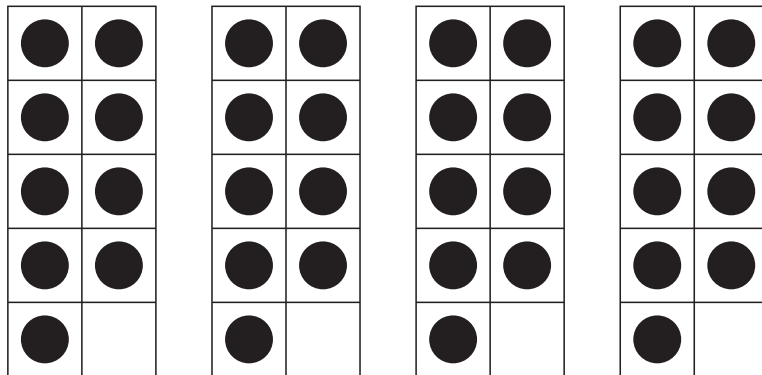
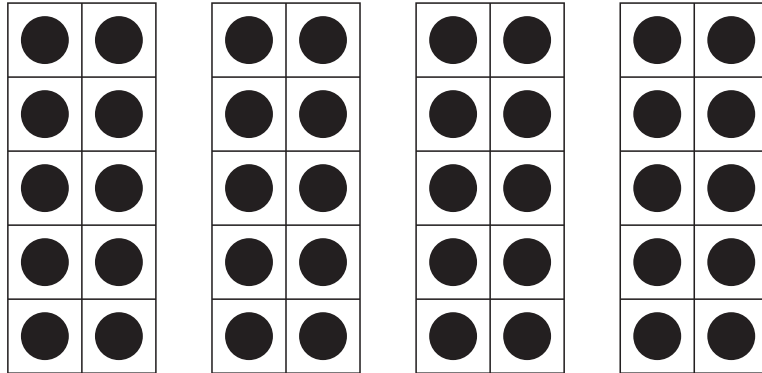
**Modifications:**

**Additional notes:**

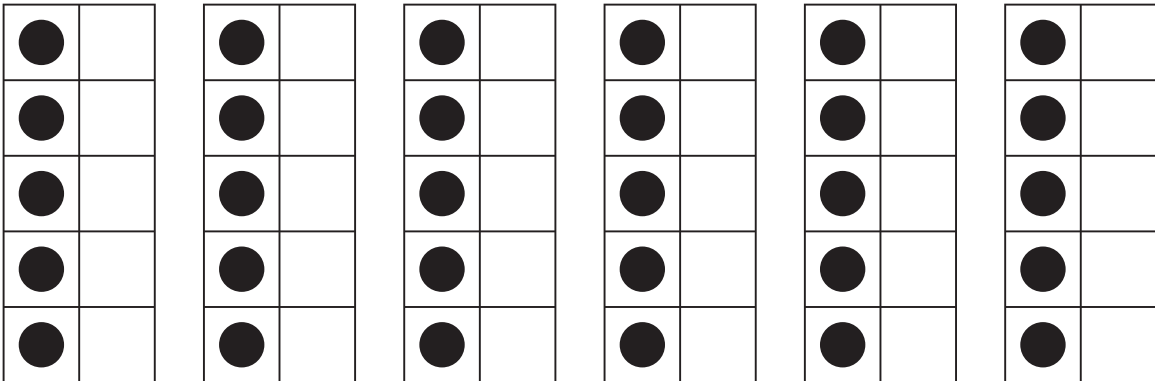
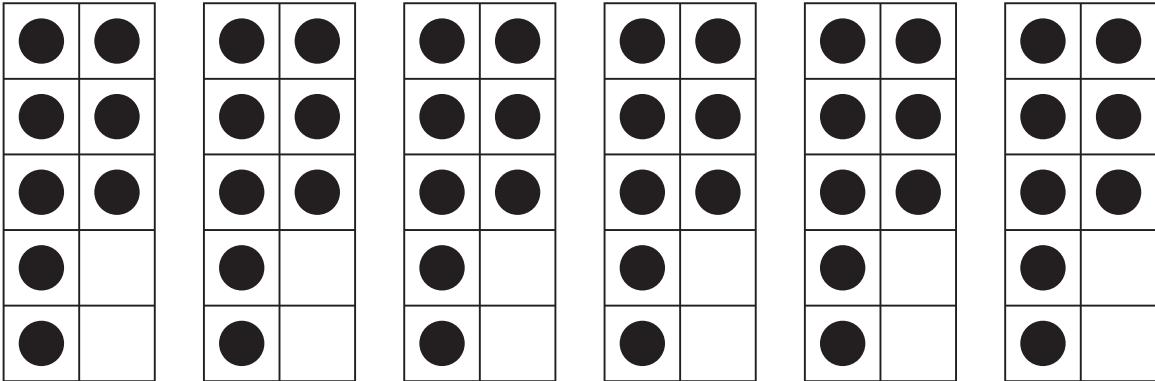
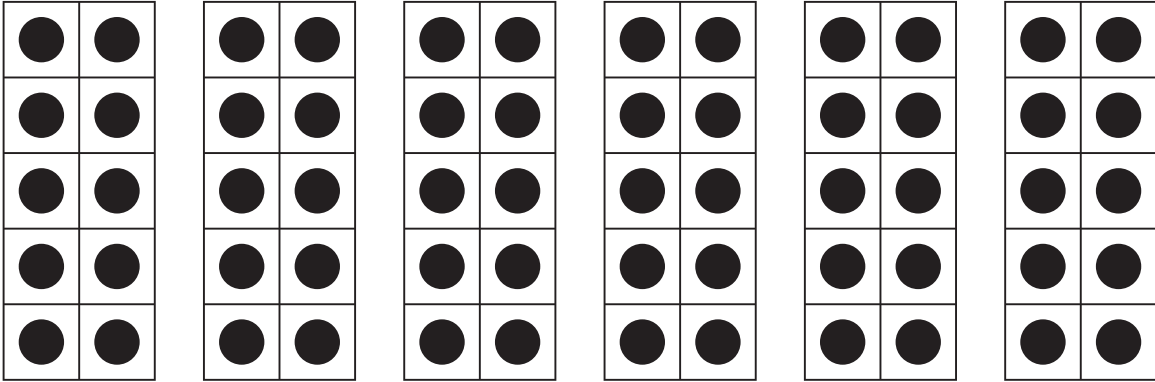
# Multiplication

**Materials:** Copy the ten frames pictures below and on the next page onto overhead transparencies.

**Instructions:** Show each row of ten frames on the projector, one at a time by turning the projector on and off quickly. If needed show the picture again by quickly turning the projector on and off. Ask the students to tell the total and how they know.

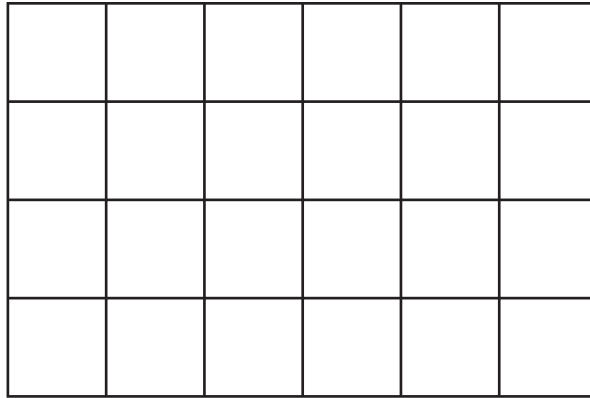


# Multiplication



# Multiplication

The second multiplication model is the array or area model. As the name suggests, this multiplication model is often linked to finding the area of a rectangle.



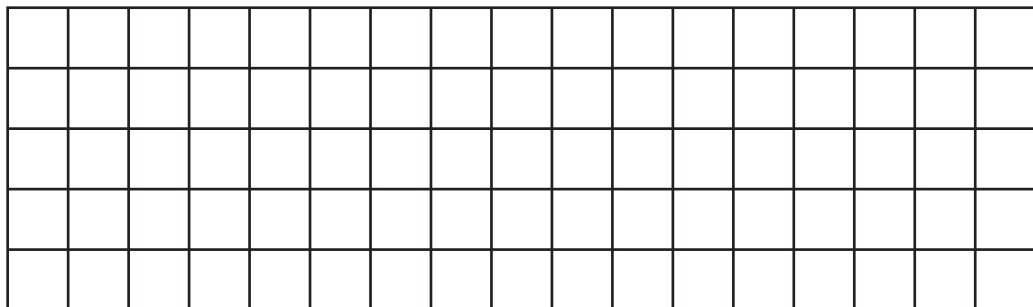
Four rows of six

$$4 \times 6 = 24$$

This second model is useful in developing an understanding of multi-digit multiplication as well as later work students will do in algebra.

**Find the area of each of the following rectangles.**

1.

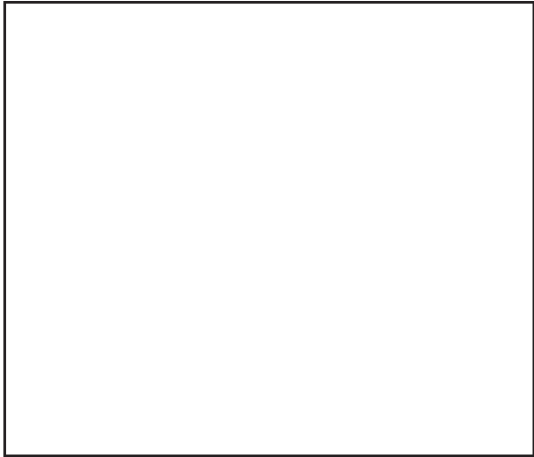


# Multiplication

2.

14 cm

12 cm



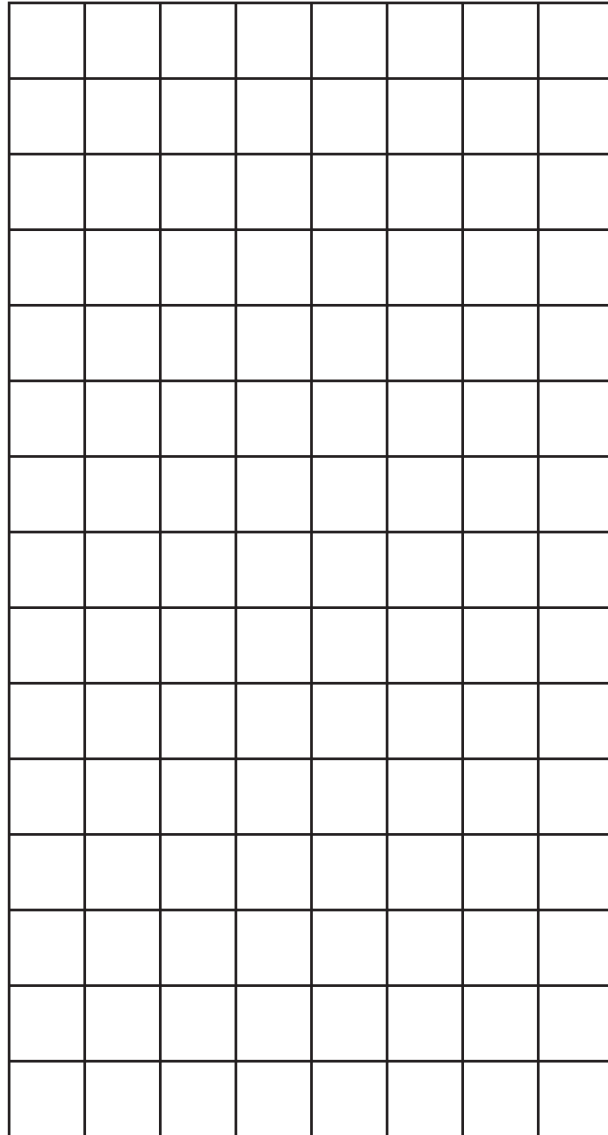
3.

15 cm

8 cm



# Multiplication



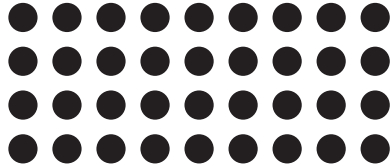
# Nice and Easy

$30 \times 3$	$50 \times 3$	$70 \times 3$	$90 \times 3$
$30 \times 4$	$50 \times 4$	$70 \times 4$	$90 \times 4$
$30 \times 6$	$50 \times 6$	$70 \times 6$	$90 \times 6$
$30 \times 7$	$50 \times 7$	$70 \times 7$	$90 \times 7$
$30 \times 8$	$50 \times 8$	$70 \times 8$	$90 \times 8$
$30 \times 9$	$50 \times 9$	$70 \times 9$	$90 \times 9$

# Multiplication

11

Write how you could calculate the total number of dots **without** counting by ones.



Computation and Number Sense

© ORIGO Publications

Grade 3

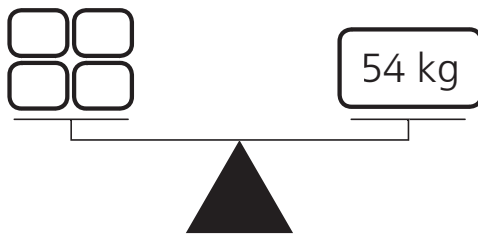


Purple Tank

Burnett, J. (2005). *The Think Tank. Purple Level*. San Ramon, CA: ORIGO Publications.

19

The smaller boxes weigh the same.



- How many kilograms does **each small box** weigh?
- Write **two ways** that you can figure out the answer **in your head**.

Computation and Number Sense

© ORIGO Publications

Grade 4



**QUICK  
THINKERS**

Green Tank

Burnett, J. (2005). *The Think Tank. Green Level*. San Ramon, CA: ORIGO Publications.

# Multiplication

10

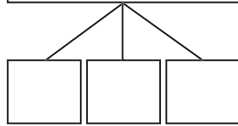
Grade 5

Imagine you divided each of these amounts into **three equal groups**.

Write two number sentences to match each one.

a.

3,216

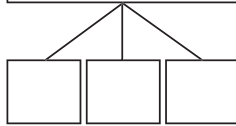


$$3,216 \div \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} \times \underline{\quad} = 3,216$$

b.

6,189

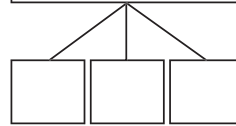


$$\underline{\quad} \div \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

c.

6,309



$$\underline{\quad} \div \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

Computation and Number Sense

© ORIGO Publications

Red Tank



Burnett, J. (2005). *The Think Tank. Red Level*. San Ramon, CA: ORIGO Publications.

**Briefly describe the ways in which multiplication, division, and the relationship of the two operations are represented in each of these problems.**

**When could you use these in your current curriculum?**

**Modifications:**

**Additional notes:**

# Number Facts

## Teaching Facts Using a Number Sense Approach

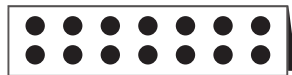
### Multiplication/Division

#### Strategies

- Use Counting
  - Tens Facts
  - Fives Facts
- Think Real World
  - Ones Facts
  - Zeros Facts

- Use Doubles
  - Twos Facts

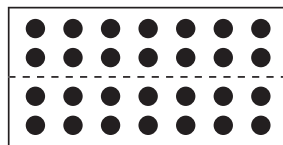
This closed dot card shows a double.  
Write the answer to the fact and its turnaround.



$$7 \times 2 = \underline{\quad} = 2 \times 7$$

- Fours Facts

This is a double double. Write the missing total.



$$7 \times 4 = \underline{\quad} = 4 \times 7$$

- Eights Facts
- Build up-Build Down
  - Nines Facts (Built down from known 'tens' facts)  
*Nine eights is the same as ten eights less a group of eight.*
  - Sixes Facts (Built up from known 'fives' facts)  
*Six sevens is the same as five sevens plus a group of seven.*
  - Threes Facts (Built up from a known 'doubles' fact)  
*Three sevens is the same as double seven plus a group of seven.*

Link division to multiplication

# Multiplication Chart

<b>X</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>0</b>	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	6	7	8	9
<b>2</b>	0	2	4	6	8	10	12	14	16	18
<b>3</b>	0	3	6	9	12	15	18	21	24	27
<b>4</b>	0	4	8	12	16	20	24	28	32	36
<b>5</b>	0	5	10	15	20	25	30	35	40	45
<b>6</b>	0	6	12	18	24	30	36	42	48	54
<b>7</b>	0	7	14	21	28	35	42	49	56	63
<b>8</b>	0	8	16	24	32	40	48	56	64	72
<b>9</b>	0	9	18	27	36	45	54	63	72	81

# Bringing it together: Computation Practice

## This or That?

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

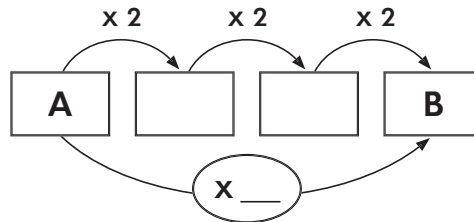
$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \bigcirc \begin{array}{|c|} \hline \square \\ \hline \end{array} = \underline{\quad}$$

# Bringing it together: Computation Practice

16

Look at this arrow chart.



- What number should appear in Box B, if
  - 20 is placed in Box A?
  - 40 is placed in Box A?
  - 60 is placed in Box A?
  - 80 is placed in Box A?
- What number should appear in the oval?

Computation and Number Sense

© ORIGO Publications

Grade 3



Purple Tank

Burnett, J. (2005). *The Think Tank. Purple Level.* San Ramon, CA: ORIGO Publications.

19

Copy and complete this chart.

	x 3	x 2	x 6
4	12		
5		10	
6			36
7			
8			



Look at the **shaded columns**.  
Write about a pattern you see.

Computation and Number Sense

© ORIGO Publications

Grade 4



Green Tank

Burnett, J. (2005). *The Think Tank. Green Level.* San Ramon, CA: ORIGO Publications.

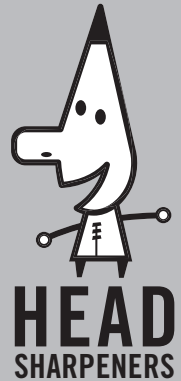
# Bringing it together: Computation Practice

8

Grade 5

Write  $<$  (is less than),  $=$  (is equal to), or  $>$  (is greater than) to make each of these true.

- a.  $10 \times 325$  \_\_\_\_  $5 \times 650$
- b.  $\$2.98 \times 6$  \_\_\_\_  $(\$2 \times 6) + (\$1 \times 6) - 6\text{c}$
- c.  $17 \times 5 \times 0 \times 9$  \_\_\_\_  $(17 \times 5) \times (0 \times 9)$
- d.  $3 \times 49$  \_\_\_\_  $4 \times 40$
- e.  $36 \times 25$  \_\_\_\_  $4 \times 9 \times 5 \times 5$



Computation and Number Sense

© ORIGO Publications

Red Tank

Burnett, J. (2005). *The Think Tank. Red Level*. San Ramon, CA: ORIGO Publications.

**Briefly describe the strategies students could use to solve each of these problems.**

**When could you use these in your current curriculum?**

**Modifications:**

**Additional notes:**

## **Activities that develop computational fluency possess one or more of the following characteristics:**

- provide open input
- are embedded in context
- encourage visual thinking
- use multiple models for number
  - counting
  - relative position
  - quantity
  - place value
- establish connections
- encourage students' language
- promote personal thinking
- support mental computation
- foster a search for patterns
- involve logical reasoning
- promote creative thought
- involve estimation