

Welcome to Parent Math Night

Cardiff Elementary

Grades

Kindergarten

Through 2nd



**What are we doing at Cardiff Elementary
to build students to this level of
thinking?**

**Computational
Fluency**

Problem Solving

Computational Fluency

Accurate

Efficient

Flexible

Appropriate

Essential Questions:

- *How do we "move" children from **counting** to combine numbers to, **fluently adding amounts** to combine numbers?*
- *How do we have students persevere in applying their knowledge of computational fluency to problems that are not familiar to them?*

Progression of Computational Fluency Kinder Through 2nd Grade

1. Knowing One More
2. Knowing Small Doubles
3. Knowing the Combinations of Ten
4. Knowing Ten and Some More
5. Doubles and Doubles Plus One
6. Knowing All Combinations Through 5/10
7. Use Make-a-Ten and Some More Strategy
8. Combining Groups of Tens
9. Combining Tens and Ones

Levels of Understanding

Level 1

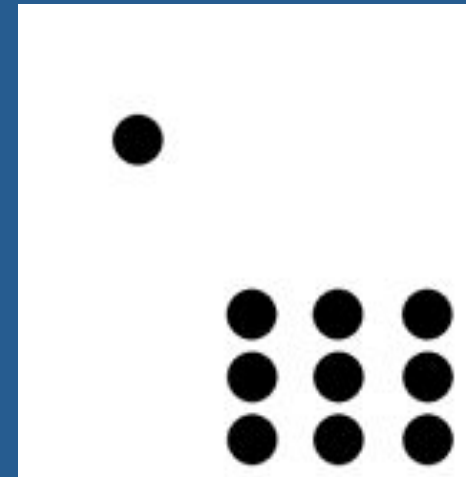
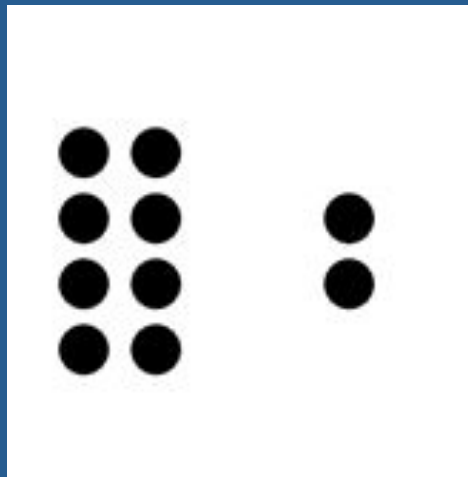
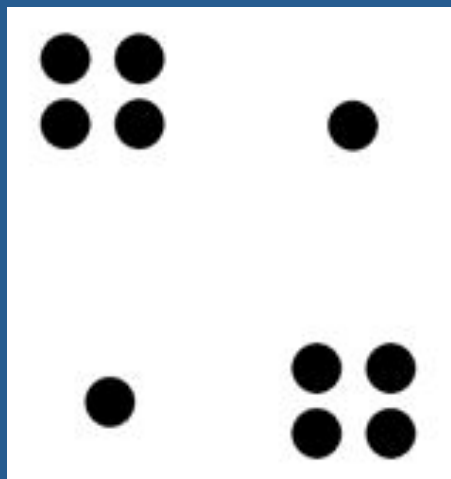
Counting by ones
(or groups)

Level 2

Using strategies based
on amounts
(Written)

Level 3
Mentally

Moving Children from Counting to Add to Knowing Amounts to Add



Dot Card Activities



Ways to make 10

$$\underline{0} + \underline{10} = 10$$

$$\underline{1} + \underline{9} = 10$$

$$\underline{2} + \underline{8} = 10$$

$$\underline{3} + \underline{7} = 10$$

$$\underline{4} + \underline{6} = 10$$

$$\underline{5} + \underline{5} = 10$$

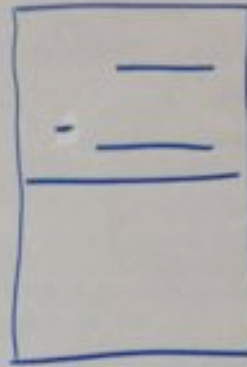
$$\underline{6} + \underline{4} = 10$$

$$\underline{7} + \underline{3} = 10$$

$$\underline{8} + \underline{2} = 10$$

$$\underline{9} + \underline{1} = 10$$

$$\underline{10} + \underline{0} = 10$$



The
Importance
of Knowing
of
Combinations
of Ten

Knowing Combinations Through Ten

5
 $1+4=5 \leftrightarrow 4+1=5$
 $2+3=5 \leftrightarrow 3+2=5$

8
 $1+7=8 \leftrightarrow 7+1=8$
 $2+6=8 \leftrightarrow 6+2=8$
 $3+5=8 \leftrightarrow 5+3=8$
 $4+4=8$

6
 $1+5=6 \leftrightarrow 5+1=6$
 $2+4=6 \leftrightarrow 4+2=6$
 $3+3=6$

9
 $8+1=9 \leftrightarrow 1+8=9$
 $7+2=9 \leftrightarrow 2+7=9$
 $6+3=9 \leftrightarrow 3+6=9$
 $5+4=9 \leftrightarrow 4+5=9$

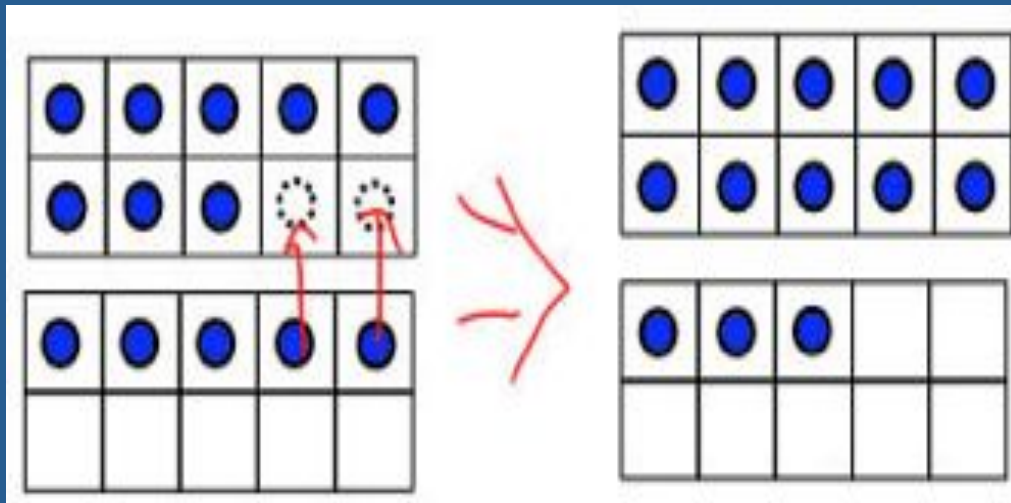
7
 $1+6=7 \leftrightarrow 6+1=7$
 $2+5=7 \leftrightarrow 5+2=7$
 $3+4=7 \leftrightarrow 4+3=7$

10
 $1+9=10 \leftrightarrow 9+1=10$
 $2+8=10 \leftrightarrow 8+2=10$
 $3+7=10 \leftrightarrow 7+3=10$
 $4+6=10 \leftrightarrow 6+4=10$
 $5+5=10$

4 = 9
part whole
dend sum
↓
equal symbol

“Make-a –Ten and Some More Strategy

$$8 + 5 \quad \text{is like} \quad 10 \text{ and } 3$$



Making a Ten-and-More Strategy

 $9 + 4$

$8 + 5$

$8 + 6$

$7 + 6$

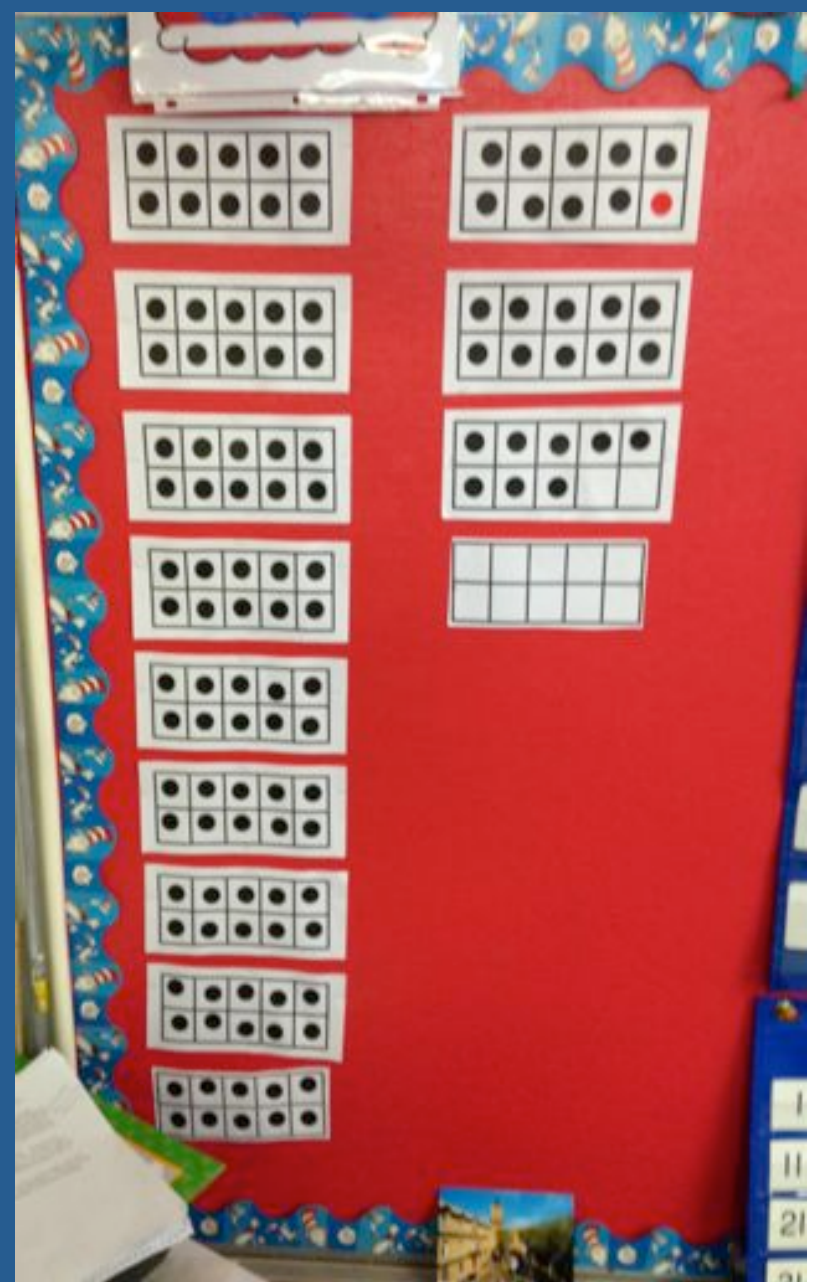
$9 + 6$

$8 + 7$

Combining Tens and Ones



Making Sense of Higher Numbers



ngle

triangle

square

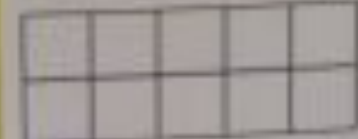
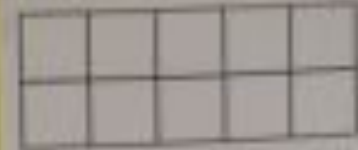
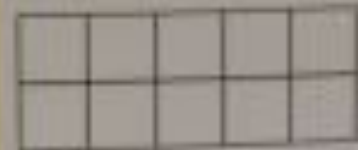
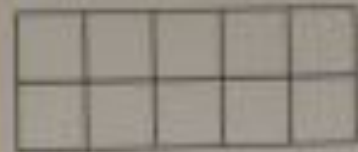
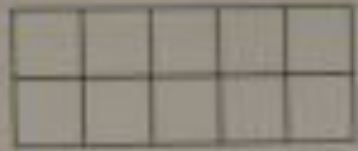
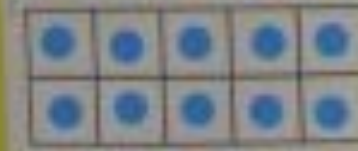
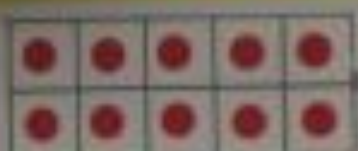
circle

Days of School

4	4
tens	ones
	□



2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23



What we are we doing at Cardiff Elementary to build students to this level of thinking:

- On your index card, write the following numbers in a line on the top:

9 5 1 5 7 3 6 14

What we are we doing at Northridge Elementary to build students to this level of thinking:

- Can you solve this problem mentally?

$$49 + 38$$

What mathematical knowledge did you need to know to solve?

- Can you solve this problem mentally?

$$247 + 378$$

What mathematical knowledge did you need to know to solve?

- How Does Horizontal Computation Help with Relational Thinking? (Algebra?)

$$247 + 378 = 248 + \square$$

$$247 = (2 \times a) + 47$$

What mathematical knowledge did you need to know to solve?

What we know - 23

23 is a big number.
or a small number.

23 is bigger than 2.

>

23 is two digits.

$$\begin{aligned} &1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 \\ &+ 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 \\ &+ 1 + 1 + 1 = 23 \end{aligned}$$

$$1 + 20 + 5 - 3 = 23$$

$$19 + 4 = 23$$

$$1 + 1 + 1 + 20 = 23$$

$$22 + 1 = 23$$

$$30 - 7 = 23$$

$$300 - 300 + 23 = 23$$

$$1000 - 987 = 23$$

$$23 + 0 = 23$$

$$20 + 3 = 23$$

$$10 + 10 + 3 = 23$$

$$7000 - 6987 = 23$$

$$13 + 10 = 23$$

$$10 + 10 + 2 + 1 = 23$$

$$2 + 6 + 2 + 10 + 3 = 23$$

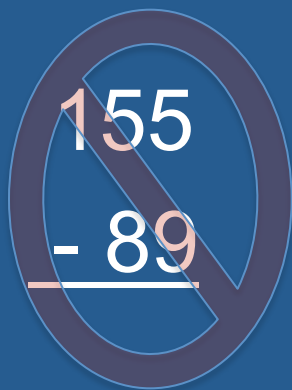
$$8 \times 2 + 7 = 23$$

Subtraction: “*The Difference of*”

What is the difference of these two numbers?

$$155 - 89$$

Can you solve this in 3 or more ways?

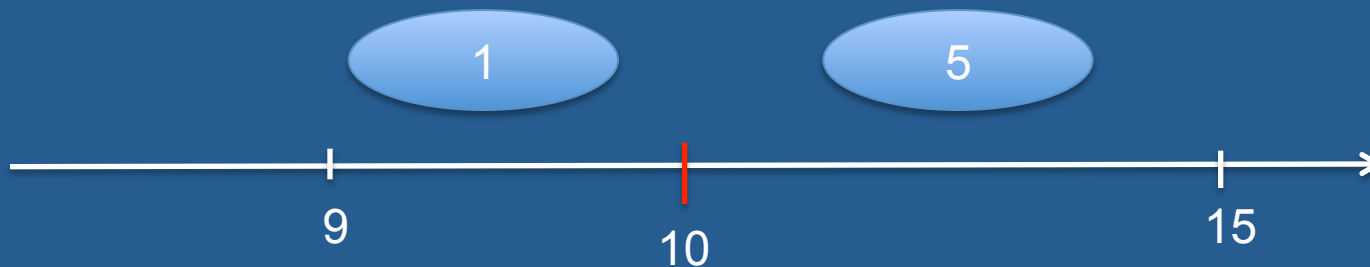


~~$$\begin{array}{r} 155 \\ - 89 \\ \hline \end{array}$$~~

Subtraction Facts Through Twenty: *“The Difference of”*

$$15-9$$

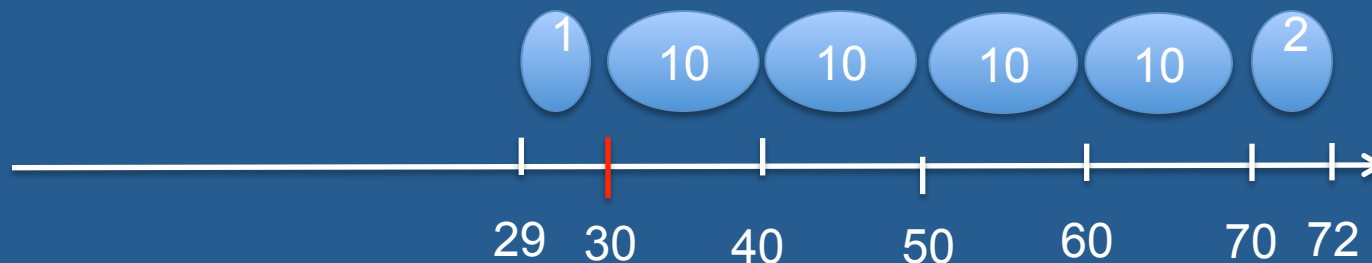
- Count Back
- Count Up By Ones
- Using an Anchor of Ten to “add up”



Subtraction With Larger Numbers: “*The Difference of*”

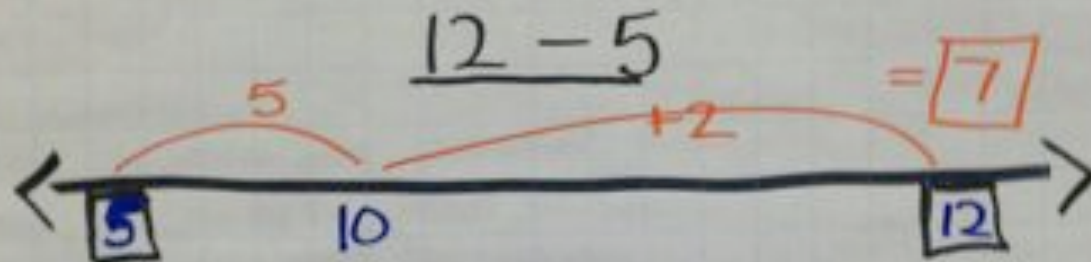
$$72 - 29$$

- Count Back
- Count Up By Ones
- Using Anchors of Tens to “add up”

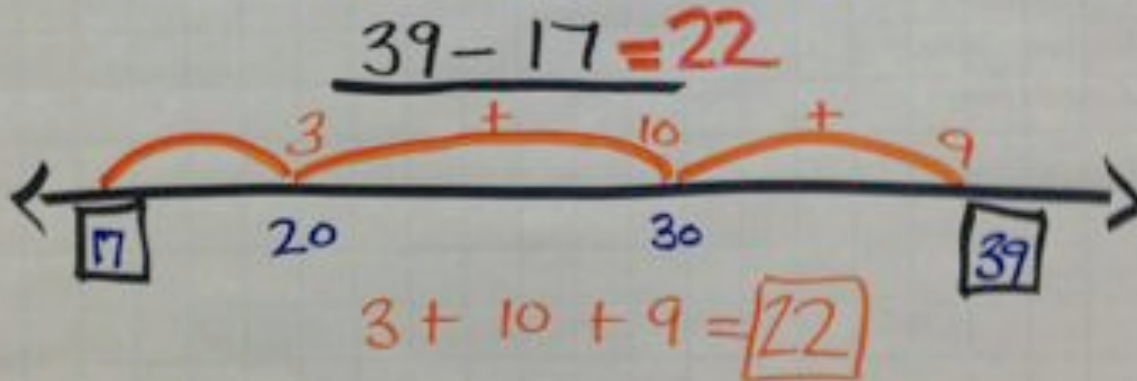


“Jump Up Method” for Subtraction

Number Lines



It works for bigger numbers...



And BIGGER numbers!

Examples of Kindergarten Problem Solving

Problem Solving

The chick caught 4 butterflies, but the duckling caught 7 butterflies. How many more did the duckling catch?

[8, 12]



butterflies. How many more did the duckling catch?

[8, 12]



3



But the duckling caught 7 butterflies. How many more did the duckling catch?

[8. 12]



7 - 2 = 5



Problem Solving

Kindergarten

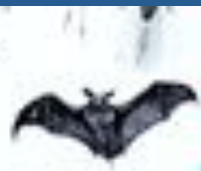
In the rafters of Room Three there are lots of insects and animals that celebrate Halloween. There were 5 spiders, 4 bats, and 5 termites. How many animals are up there in all?



[6, 4, 6] [10, 5, 10] [15, 8, 15]

... How many animals are up there in all?

[0, 4, 6] [10, 5, 10] [15, 8, 15]

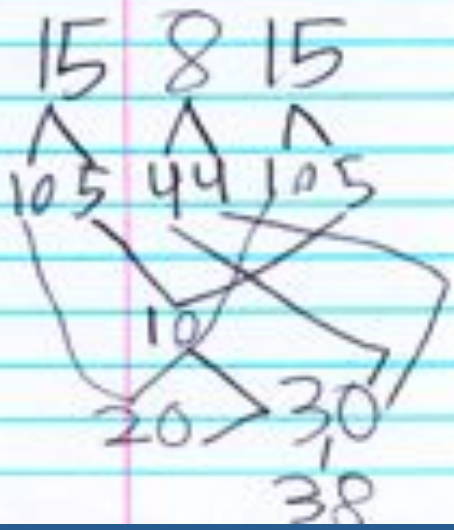


$$5 + 5 = 10 + 4 = \boxed{14}$$

[6, 4, 6]

$$6 + 4 = 10 + 6 = 16$$

[15, 8, 15]



In the rafters of Room Three there are lots of insects and animals that celebrate Halloween. There were 5 spiders, 4 bats, and 5 termites. How many animals are up there in all?

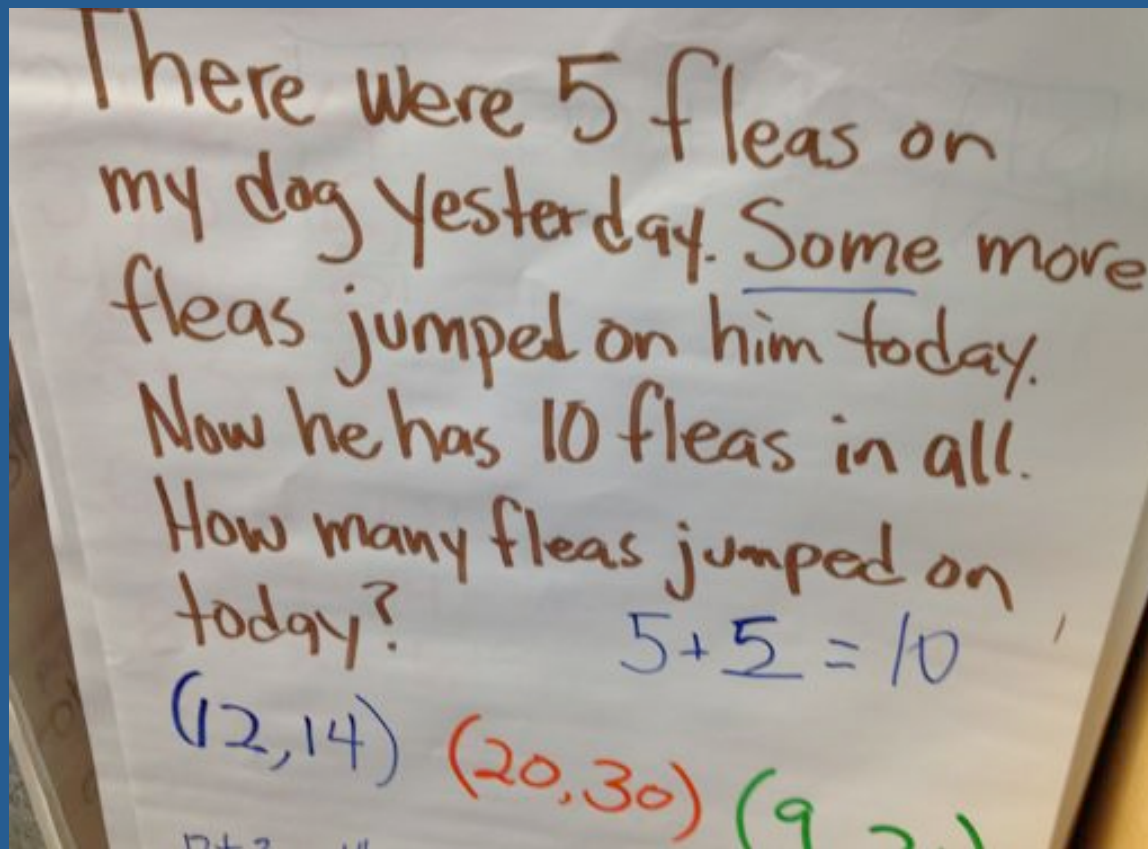
{6, 4, 6} {10, 5, 10} {15, 8, 15}



$5 + 5 = 10$ $10 + 4 = 14$
If 5 bats and 5 termites and 4 spiders there will be 14.

Examples of First Grade Problem Solving

1st Grade Problem Solving



An engineer had 24 teeth. The dentist pulled 2 teeth out every day for a week!
How many teeth did he have at the end of the week?
(1 tooth) (3 teeth) (4 teeth)

4

$$24 - 14 = 10$$

~~HE pulled out 14 teeth!~~

24 22 20 18 16 14 12 10

	M	T	W	Th	F	Sat.	Sun	
24	22	20	18	16	14	12	10	(10)

24 23 22 21 20 19 18 17

	M	T	W	Th	Fr	Sat	Sun	
24	23	22	21	20	19	18	17	(17)

24 21 18 15 12 9 6 3

	M	T	W	Th	Fr	Sat	Sun	
24	21	18	15	12	9	6	3	(3)

24 20 16 12 8 4 0

	M	T	W	Th	F	SAT	SUN	
24	20	16	12	8	4	0		(It's impossible)

Examples of Second Grade Problem Solving

Second Grade

Esther ate 40 lizards. Courtney had 28 lizards. How many more lizards did Esther have than Courtney?

(53, 18) (66, 33) (74, 14) (89, 58)

$$\begin{array}{r} 28 \\ + 40 \\ \hline 68 \end{array}$$

Handwritten work showing the addition of 28 and 40. The number 28 is written on the left. A horizontal line is drawn below it. The number 40 is written to the right of the line. A plus sign is written above the 8. A curved line connects the 2 in 28 to the 4 in 40. The number 30 is written below the line, under the 2 and 4. The number 10 is written above the line, under the 8 and 0. The number 68 is written below the line, under the 2 and 4. The number 12 is circled below the line, under the 8 and 0.

31 turkeys jumped into my car this morning. 31 more jumped in my car this afternoon. How many turkeys did I have altogether?

(45, 45) (60, 18) (25,24) (37,37) (49,46)

(45, 45) (60, 18) (25, 24) (37, 37) (49, 46)

$$31 + 31 = 62$$

$$45 + 45 = 90$$

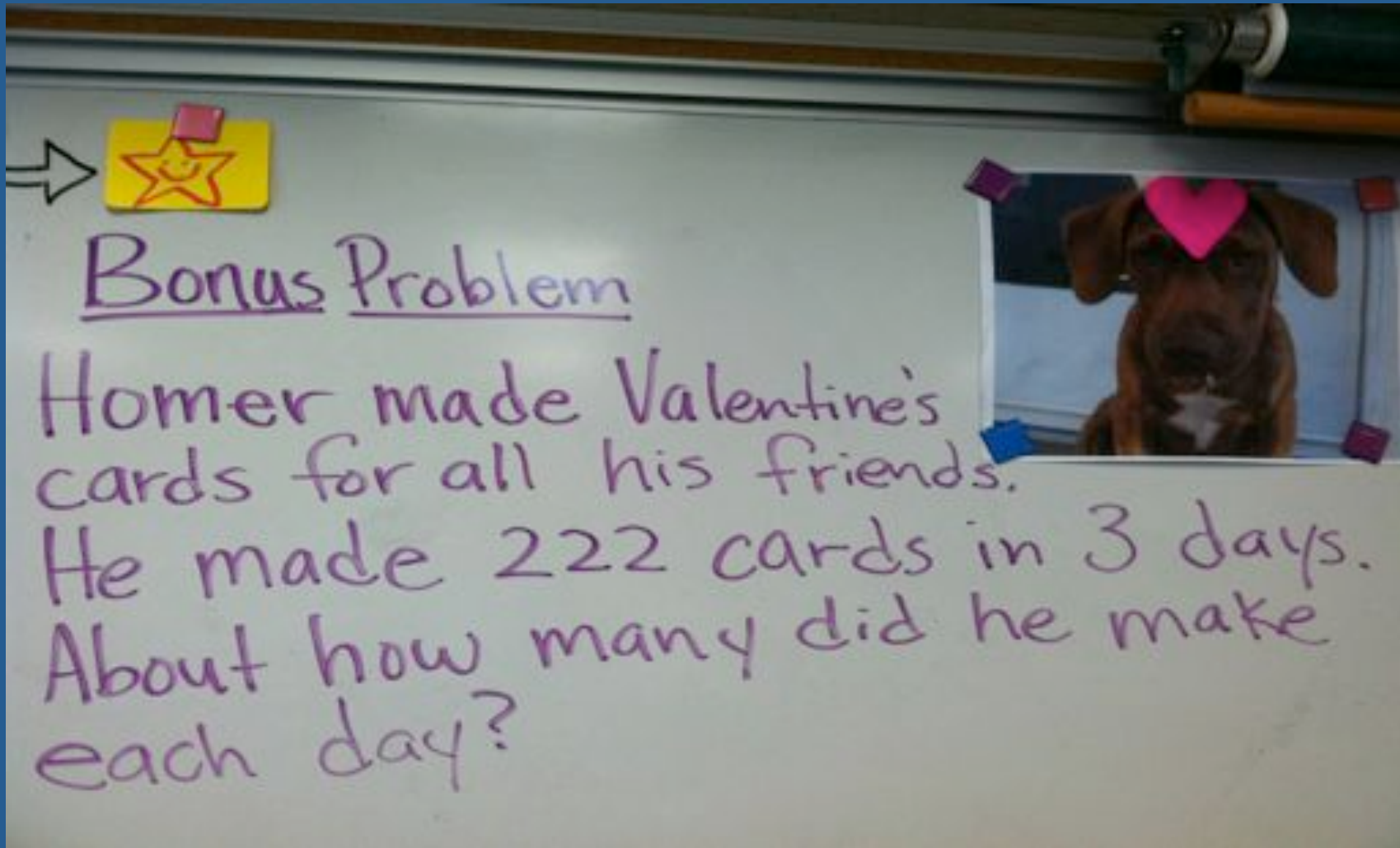
$$60 + 18 = 78$$


$$25 + 24 = 49$$

$$37 + 37 = 74$$

$$49 + 46 =$$

Problem Solving



→ 

Bonus Problem

Homer made Valentine's cards for all his friends.
He made 222 cards in 3 days.
About how many did he make each day?

How to help your students at home:

Do's

- Have your child explain how they are thinking about the problem and how they are solving it.
- Let them grapple.
- Ask questions: Can you explain? How did you know? Can you tell me again? Share your thinking too.

Don't's

- Don't rush to the algorithm (carrying and borrowing)
- Don't be in a hurry to increase adding and subtracting huge numbers. Understanding comes from being fluent with numbers under 20 and then numbers under 100.
- If your child is struggling with a concept, lower the number and then raise it back up slowly.