



Handouts for 3-5 Number

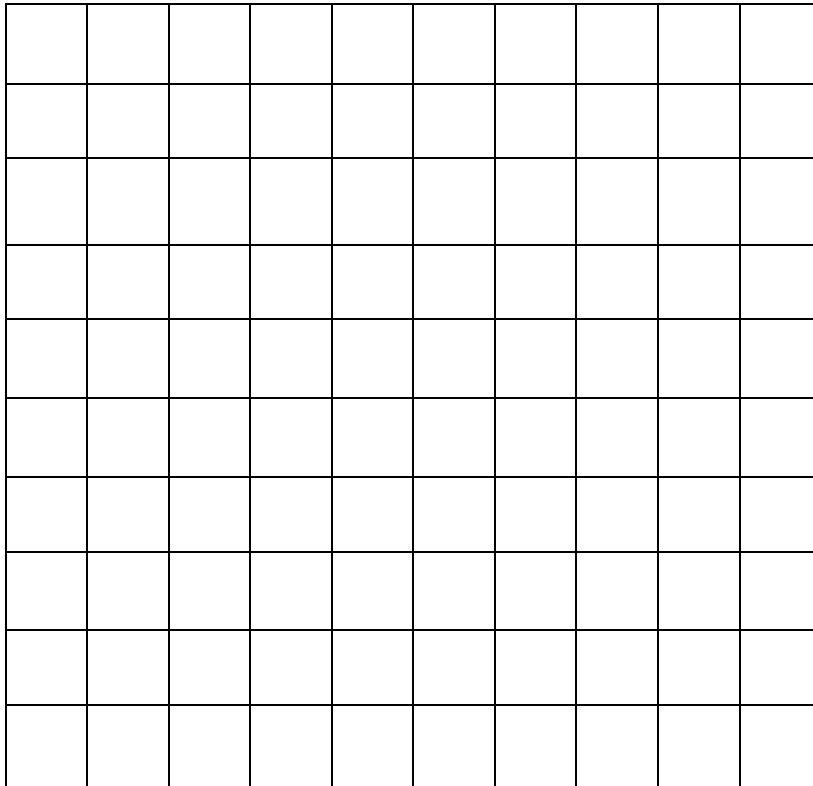
2008-2009

Big Ideas in the Number Strand

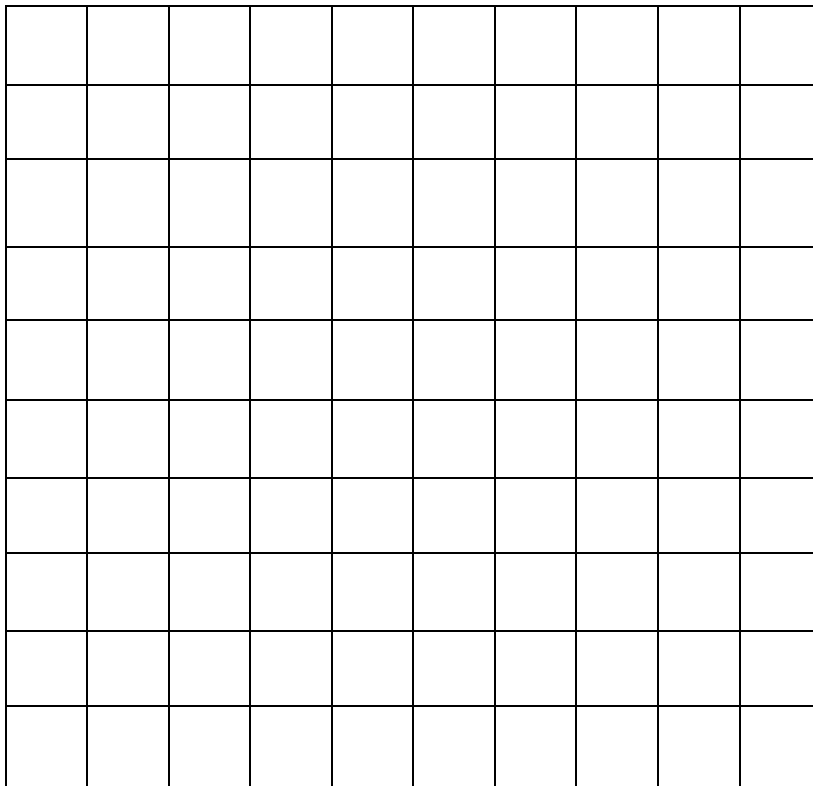
<p>1. Numbers can be classified in multiple ways to show relationships</p> <ul style="list-style-type: none"> ○ Properties are the basis of classifications ○ Some representations show equivalent relationships ○ Part-whole relationships can reflect composing and decomposing 	
<p>2. Numbers in elementary mathematics are represented using a base-10 place value system</p> <ul style="list-style-type: none"> ○ System - based on groupings of ten - allows us to represent all numbers with just 10 digits ○ Digits have different values depending on their positions (both whole numbers and decimals) ○ Students must understand both place value and face value ○ Composite groups (groups of more than one) can be counted multiple times and operated on as an entity 	
<p>3. Dealing with multiplicative reasoning requires a shift in thinking about numbers from numbers representing single units to composite units that are grouped</p> <ul style="list-style-type: none"> ○ Instruction should focus on helping students identify, create, and count composite groups ○ Composite groups (groups of more than one) can be counted multiple times and operated on as an entity 	
<p>4. Operations (addition, subtraction, multiplication, division) are used to suggest distinct actions that are defined mathematically and are dependent on the context; performing those actions leads to consistent results for all numbers (whole and rational)</p> <ul style="list-style-type: none"> ○ Operation relationships are an important part of number sense ○ Properties combined with operations are the foundation of arithmetic ○ Properties lead to mathematical generalizations 	
<p>5. Reasonable estimates reflect an understanding of both operations and number relationships</p> <ul style="list-style-type: none"> ○ Context influences what an appropriate range (estimate) would be ○ Appropriate estimates reflect students' sense making 	
<p>6. Fluency (accuracy, efficiency, flexibility) is reasoning about and using rational number operations with understanding</p> <ul style="list-style-type: none"> ○ Mastery involves knowing strategies for retrieving basic facts and being able to apply them in other computations ○ Fluency is built upon number relationships, place value, properties, and operation understandings 	

Things that Come in Groups
Multiplication Notes

Use two different colors. Shade $.14$ and then shade $.3$.



Use two different colors. Shade $.4$ and then shade $.30$.



In each figure, which is larger?

Number Sort Master

7	21	0.52
fourth	900	910
$2\frac{1}{2}$	$\frac{1}{4}$	336
917	64	$\frac{3}{8}$

Number Sort

$\frac{9}{2}$	$\frac{75}{100}$	$\frac{1}{2}$
1.5	6,320	$100 \div 2$
$\frac{2}{8}$	$\frac{12}{8}$	1 st
32 nd	$24 \div 6$	$\frac{16}{4}$

Number Sort

0	1,000	$\frac{3}{4}$
9.75	964	12,842
Four-eighths	Eight hundred	33.33
twelve	$12\frac{4}{8}$	$\frac{1}{3}$

Addition Strategies

Compiled by Judy Rucker and Tery Gunter

Many strategies depend on ideas of place value.

A. Adding by place

$$57 + 34$$

$$50 + 30 = 80$$

$$7 + 4 = 11 \quad \text{*Students may mentally decompose the 4 (3 + 1)}$$

$$80 + 11 = 91 \quad \text{Students may mentally decompose the 11 (10 + 1)}$$

B. Keeping one number whole and adding on the other number in parts

$$57 + 37$$

$$57 + 30 = 87$$

$$57 + 30 = 87$$

$$87 + 7 = 94$$

$$87 + 3 = 90 \quad \text{(decompose the 7 into 3 + 4)}$$

$$90 + 4 = 94 \quad \text{associative property for addition}$$

C. By using a traditional algorithm of “carrying” (“regrouping” or “renaming”)

D. Compensation involves reformulating, adjusting, changing numbers to make the numbers easier to work with. Compensation supports fluency in mental math.

One Way Add an amount to one addend; subtract the same amount from the sum.

$$59 + 38 \quad \text{Add 1 to the 59}$$

$$60 + 38 = 98$$

$$98 - 1 = 97 \quad \text{Subtract 1 from the answer to compensate.}$$

Another Way Add an amount to one number and subtract the same amount from the other number.

$$59 + 38$$

$$60 + 37 = 97 \quad \text{Add 1 to 59 and subtract one from 38 to maintain an equivalent expression.}$$

Subtraction Strategies

Subtraction strategies include subtracting in parts, adding up, and subtracting back.

A. Subtracting in Parts

$$72 - 49 =$$

$$72 - 40 = 32$$

$$32 - 9 = 23 \quad \text{(students may subtract the 2 first and then 7 more)}$$

$$72 - 49 =$$

$$72 - 40 = 32$$

$$32 - 10 = 22 \quad \text{(made an easier problem - subtracted 1 too many)}$$

$$22 + 1 = 23 \quad \text{Compensation: Added 1 back to the answer.}$$

B. Adding Up

$$49 - \underline{\quad} = 72$$

$$49 + \underline{\quad} = 50$$

$$50 + 20 = 70 \quad \text{The answer is in the parts that are added to make 72.}$$

$$70 + 2 = 72 \quad 1 + 20 + 2 = 23$$

Number Sort

7	21	0.52
$3\frac{3}{4}$	919	$\frac{1}{2}$
252	704	336
827	64	$\frac{3}{8}$

Number Sort

0	1,000	1 st
3.75	10/2	1/3
2.5	8 million	33.33
3,500	32 nd	1/5