Math Strategies We Use in 4th Grade

- The Equivalent Ratio Strategy

  $792 \div 8$

  $792 \div 8 = \frac{792}{8}$

Number of Tickets	792	396	198	99
Number of Kids	8	4	2	1

- The "Over" Strategy

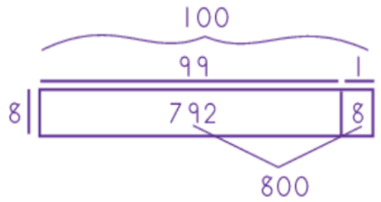
  $792 \div 8$

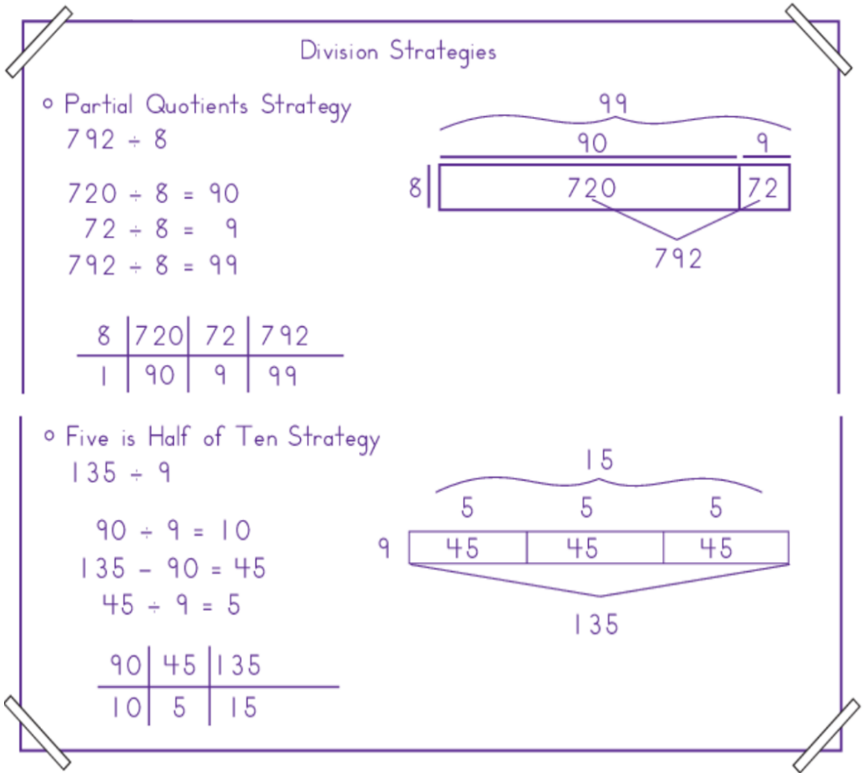
  $800 \div 8 = 100$

  $8 \div 8 = 1$

  $792 \div 8 = 99$

8	800	792
1	100	99





This booklet will show you some of the strategies I have learned to be more successful at solving problems. As I become a stronger mathematician, I learn how and why problems can be solved in different ways. The more I learn and use these different strategies, the more efficient and accurate I will become.

Addition

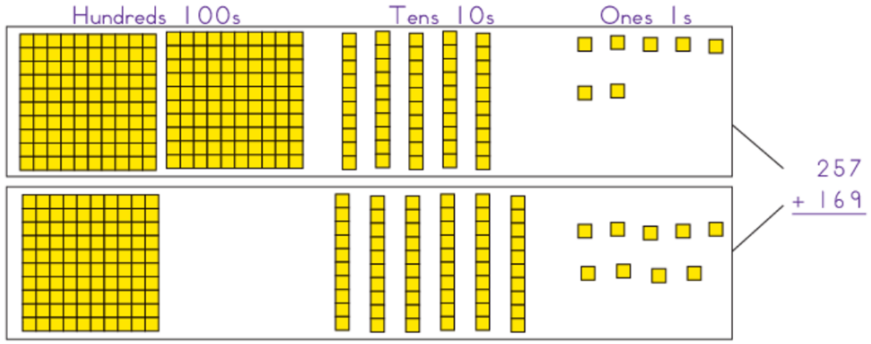
Number line

697 + 178

697 + 3 = 700
+ 178 − 3 = 175
875

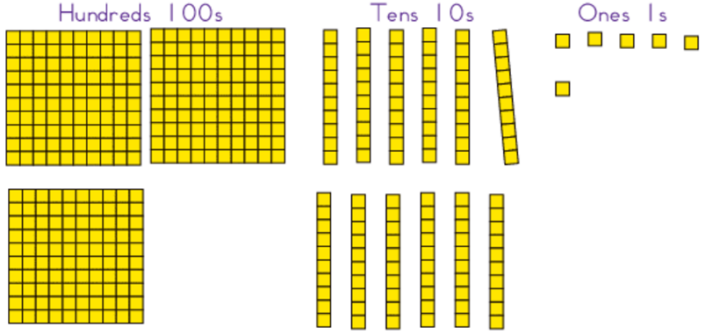
Base Ten Model

Modeling helps me get ready for the standard algorithm because I can line up the digits by place value and see what is needed.

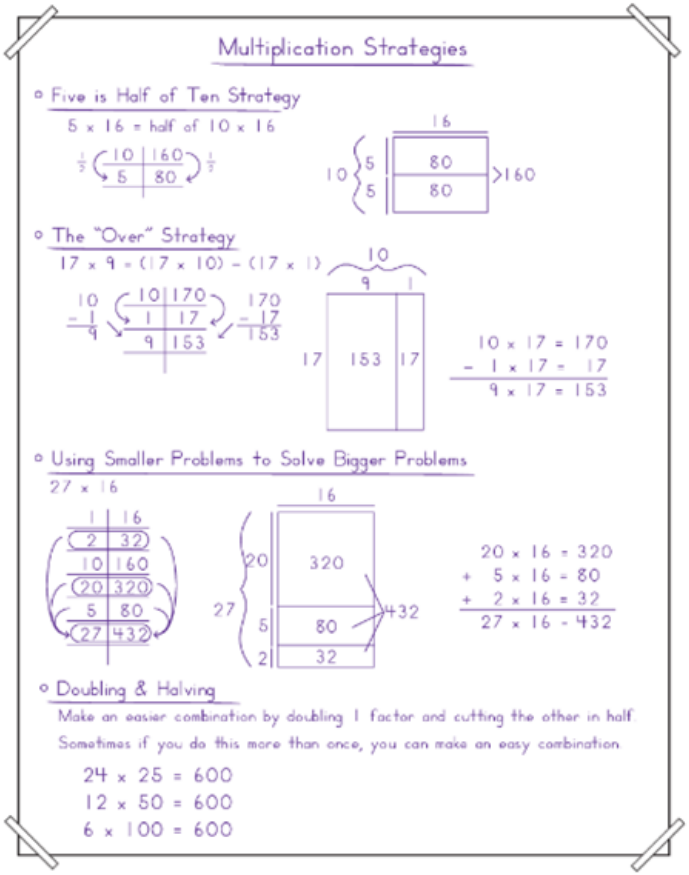


257
+ 169

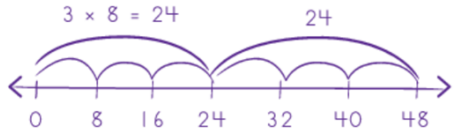
I can regroup the tens and hundreds places.



1
257
+ 169
6



Open Number Line

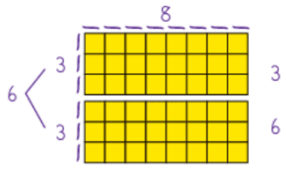


Ratio Table

Rows of crayons	Number of crayons
1	8
2	16
3	24
6	48

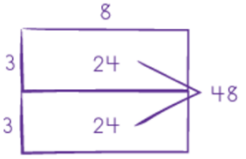
× 2 (3 → 6); × 2 (24 → 48)

Tile Array



3 x 8 = 24
6 x 8 = 48

Area Model

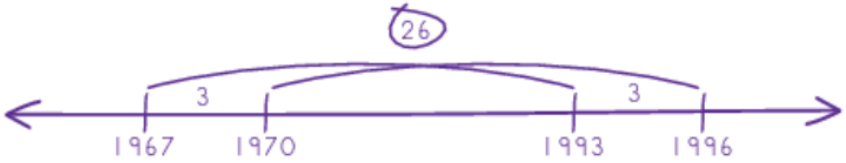


Luke and Devon's Find the Difference Strategy

1993 – 1967

David and Gloria's Constant Difference Strategy

1993 – 1967 = 1996 – 1970



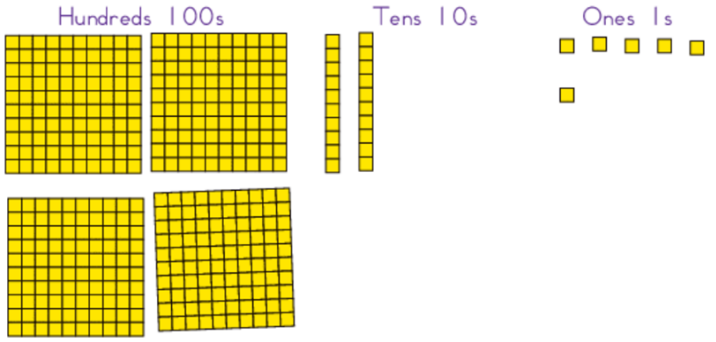
1993 + 3 = 1996
– 1967 + 3 = 1970
26

Shari and Ted's Start With the 1s Strategy

8 13
1993
– 1967
26

13 – 7 = 6
8 – 6 = 2

Why does it work?



11
257
+ 169
426

Place Value Splitting

I can break numbers up by place value without models to see if I need to regroup while adding.

158 = 100 + 50 + 8
+ 275 = 200 + 70 + 5
300 + 120 + 13 = 420 + 13 = 433

Algorithm

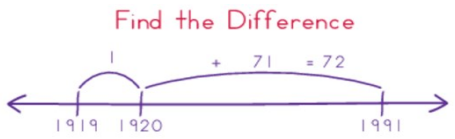
As I become more efficient, I understand and use the standard algorithm to solve addition problems.

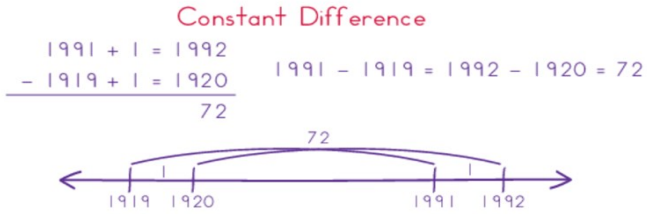
111
1,947
+ 99
2,046

1 1
58,379
+ 31,850
9 ,229

Subtraction

Number Line

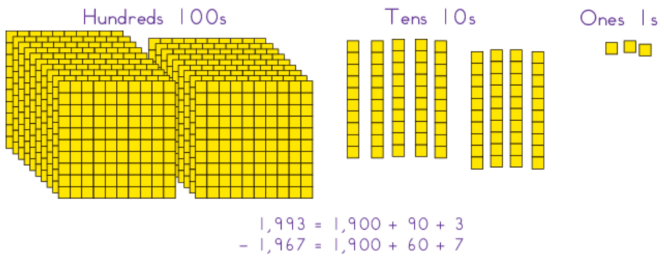




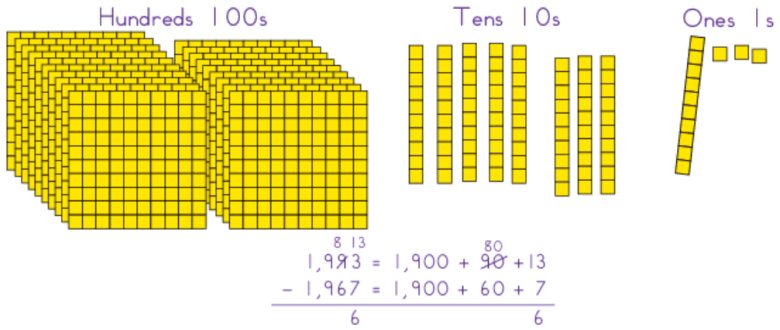
Base Ten Model

Modeling helps me get ready for the standard algorithm because I can line up the digits by place value and see what is needed.

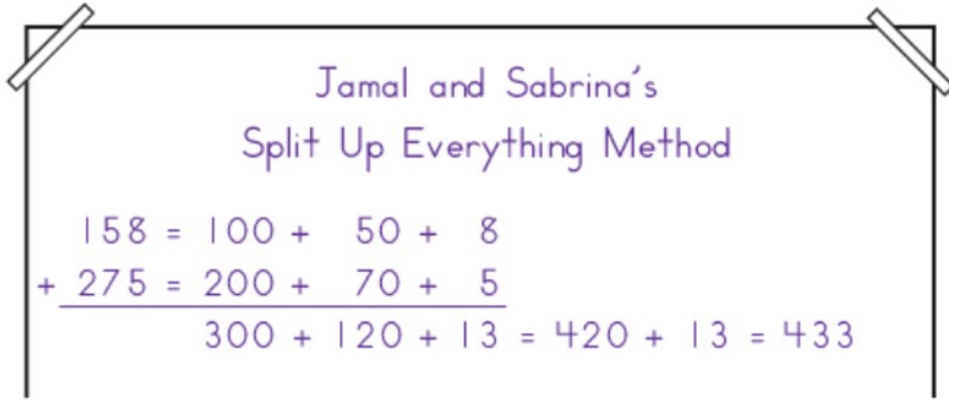
1993-1967

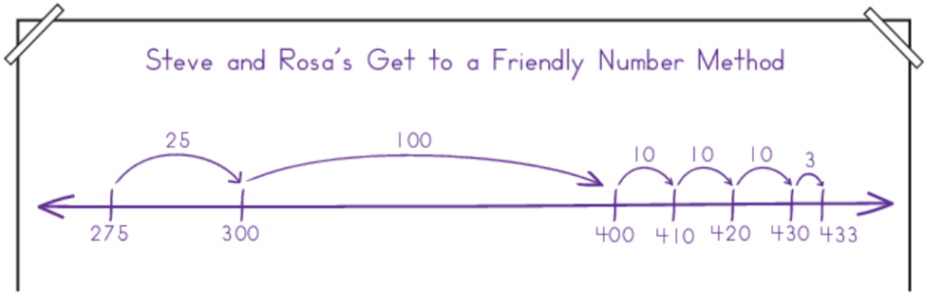


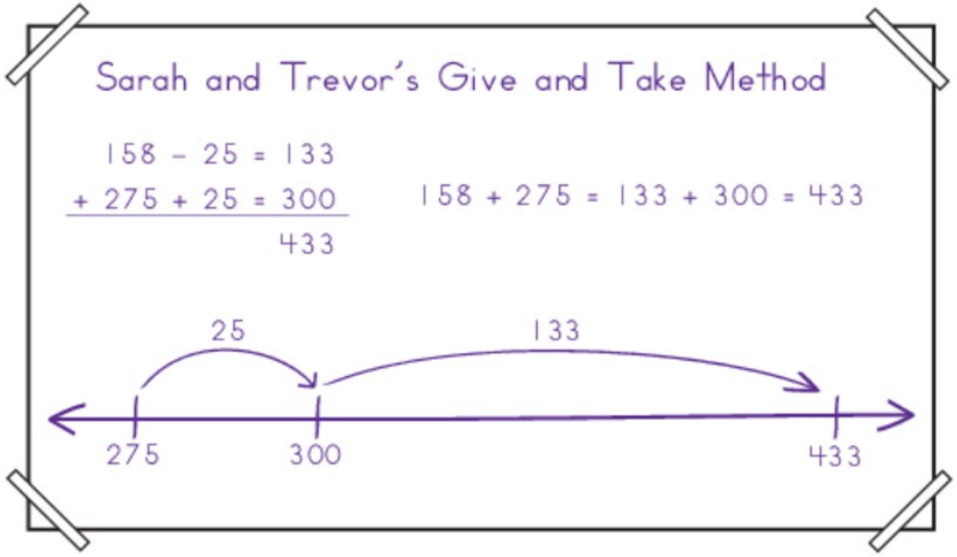
I need to move a ten to the ones place to be able to subtract.



Here are some example of students using different strategies:



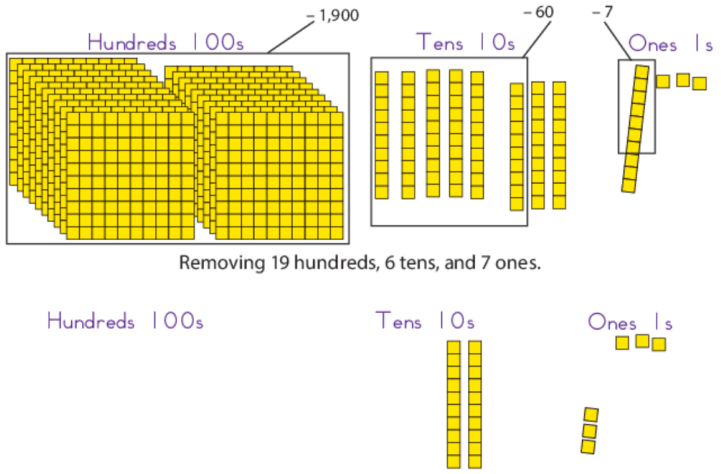




End of the Year Expectations

- Use the standard algorithm to add and subtract with 1,000,000
- Use strategies to multiply and divide a 4-digit number by 1-digit number
- Use strategies to multiply 2 two-digit number
- Add and subtract fractions with denominators: 2, 3, 4, 6, 8, 10, 12
- Add and subtract mixed fractions
- Multiply a fraction by a whole number
- See relationship between decimals and fractions

I can then subtract 1967.



Place Value Splitting

I can break numbers up without models to see if I need to regroup while subtracting.

8 13
1,9~~9~~3 = 1,900 + ~~90~~ 80 + 13
− 1,967 = 1,900 + 60 + 7
26 20 + 6

Algorithm

As I become more efficient, I understand and use the standard algorithm to solve subtraction problems.

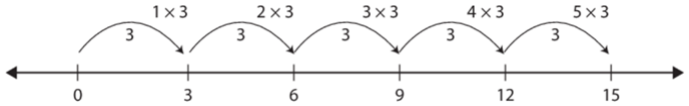
8 11
1,9~~9~~1
− 1,919
72

1961
− 1934
0033

Multiplication

I build on my multiplication reasoning from 3rd grade to do more complex multiplication problems

Number Line/Skip Counting



4×27

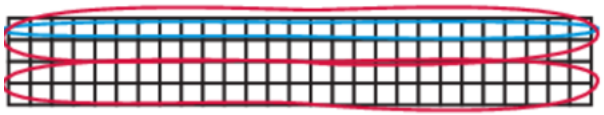
27, 54, 81, 108

Skip-Counting

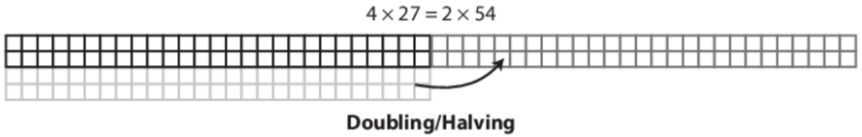
Doubling & Halving

4×27

27, 54, 108



Doubling

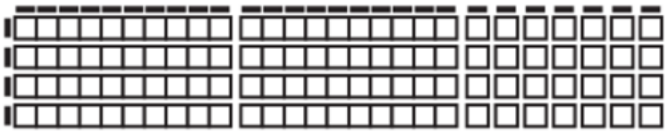


Doubling/Halving

Tile Array Partial Product

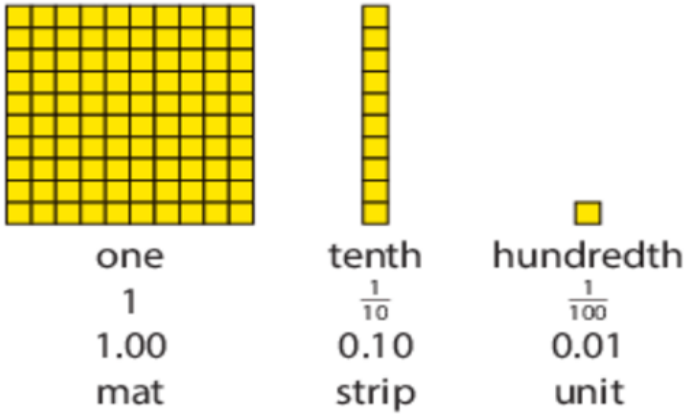
I start by using arrays like I did in 3rd grade, but move on to the area model.

$4 \times 27 = (4 \times 10) + (4 \times 10) + (4 \times 7)$



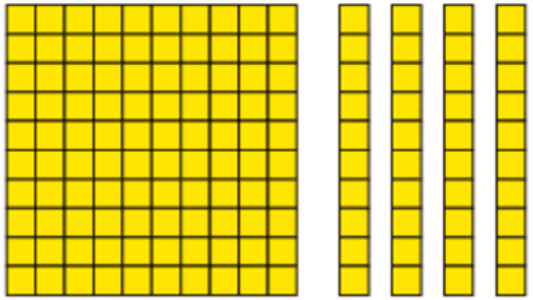
Decimals

I can recognize decimals using base ten pieces as decimals or fractions.



I could name this model one and four-tenths and write it as a fraction number 1 4/10 or as a decimal number 1.4

I could see that it can be named one and forty-hundredths and be written as 140/100 or 1.40.



Fractions

Only denominators 2, 3, 4, 5, 6, 8,10,12,100 are used in 4th grade.

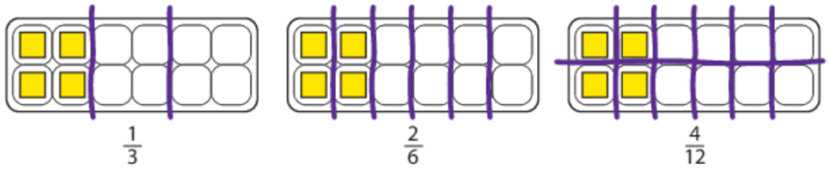
Number Line

I can order fractions and decimals on a number line to compare

value and equivalence.

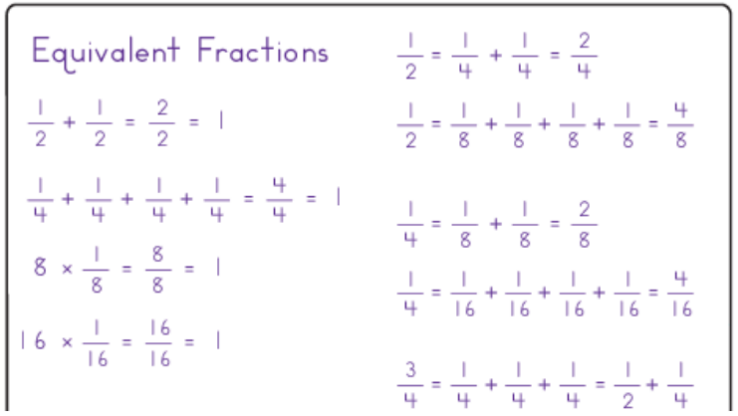
Models

I can use models to see if fractions are equivalent.

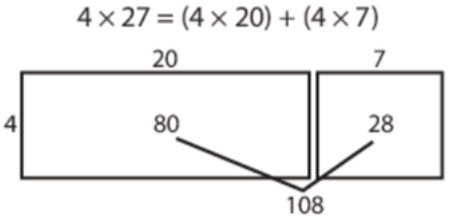


Equations

I can use addition and multiplication strategies.

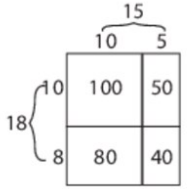


Area Model

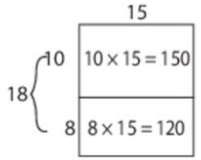


I

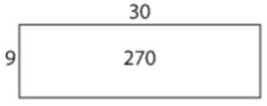
I can break down problems using the area model to help me make sense of the task using a variety of different strategies.



100 + 80 + 50 + 40
Four partial products

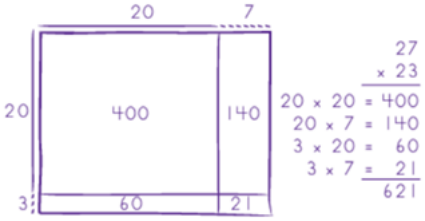


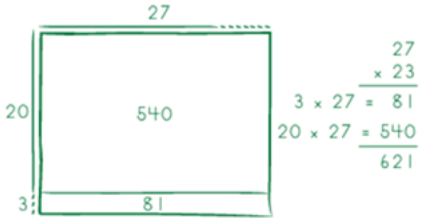
150 + 120
Two partial products



18 × 15 = 9 × 30
Doubling-Halving

As I build my understanding, I move towards using an algorithm to become more efficient.

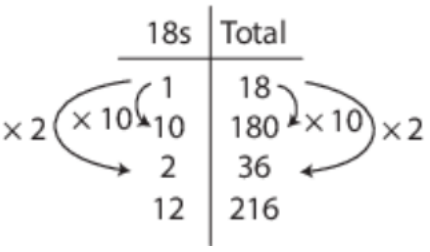




Ratio Table

I can see the pattern in a ratio table to help me solve problems.

18s	Total
1	18
2	36
3	54
4	72
5	90
6	108
7	126



Division

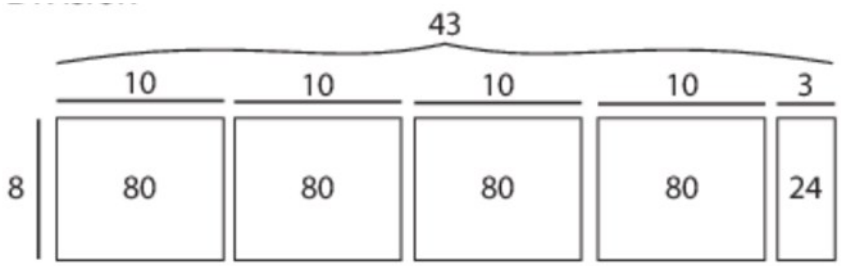
I use my understanding of the relationship between multiplication and division to help me solve problems.

Area Model

I can break down numbers to find the answer. This is similar to the equal groups I made in 3rd grade.

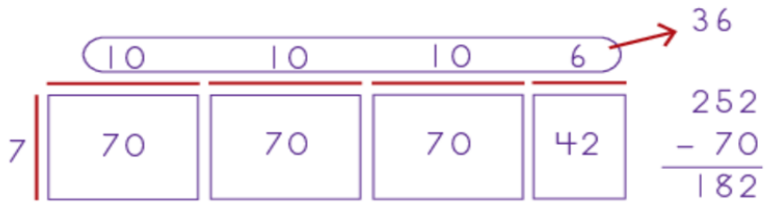
344÷ 8 =43

I made each group of 10 x 8 and continued until I couldn't make a complete group of 80. I grouped total of 320. I had 24 more to reach



80 + 80 + 80 + 80 = 320
320 + 24 = 344

8 × 43 = 344
so
344 ÷ 8 = 43



252 ÷ 7 = 36

36

252
− 70
182
− 70
112
− 70
42
− 42
0

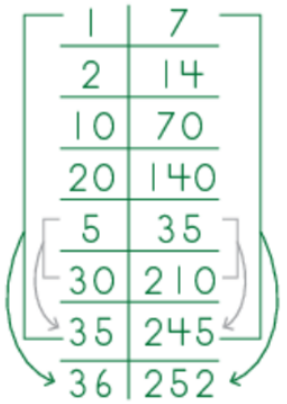
252 ÷ 7 = 36

140 + 70 = 210
252 − 210 = 42
42 ÷ 7 = 6

Ratio Table

I can use a ratio table to see patterns and multiplicative relationships between numbers to create partial products to find the final product.

252 ÷ 7 = ?



1	7
2	14
10	70
20	140
5	35
30	210
35	245
36	252

35 + 210 = 245
245 + 7 = 252
so 252 ÷ 7 = 36

Strategy for solving 243 ÷ 9

Number of Groups	1	10	20	5	2	27
Total	9	90	180	45	18	243

20 + 5 + 2
180 + 45 + 18

Another strategy for solving 243 ÷ 9

Groups	Total	
1	9	1 × 9 = 9
10	90	10 × 9 = 90
20	180	20 × 9 = 180
5	45	5 × 9 = 45
2	18	2 × 9 = 18
27	243	

243 ÷ 9 = 27