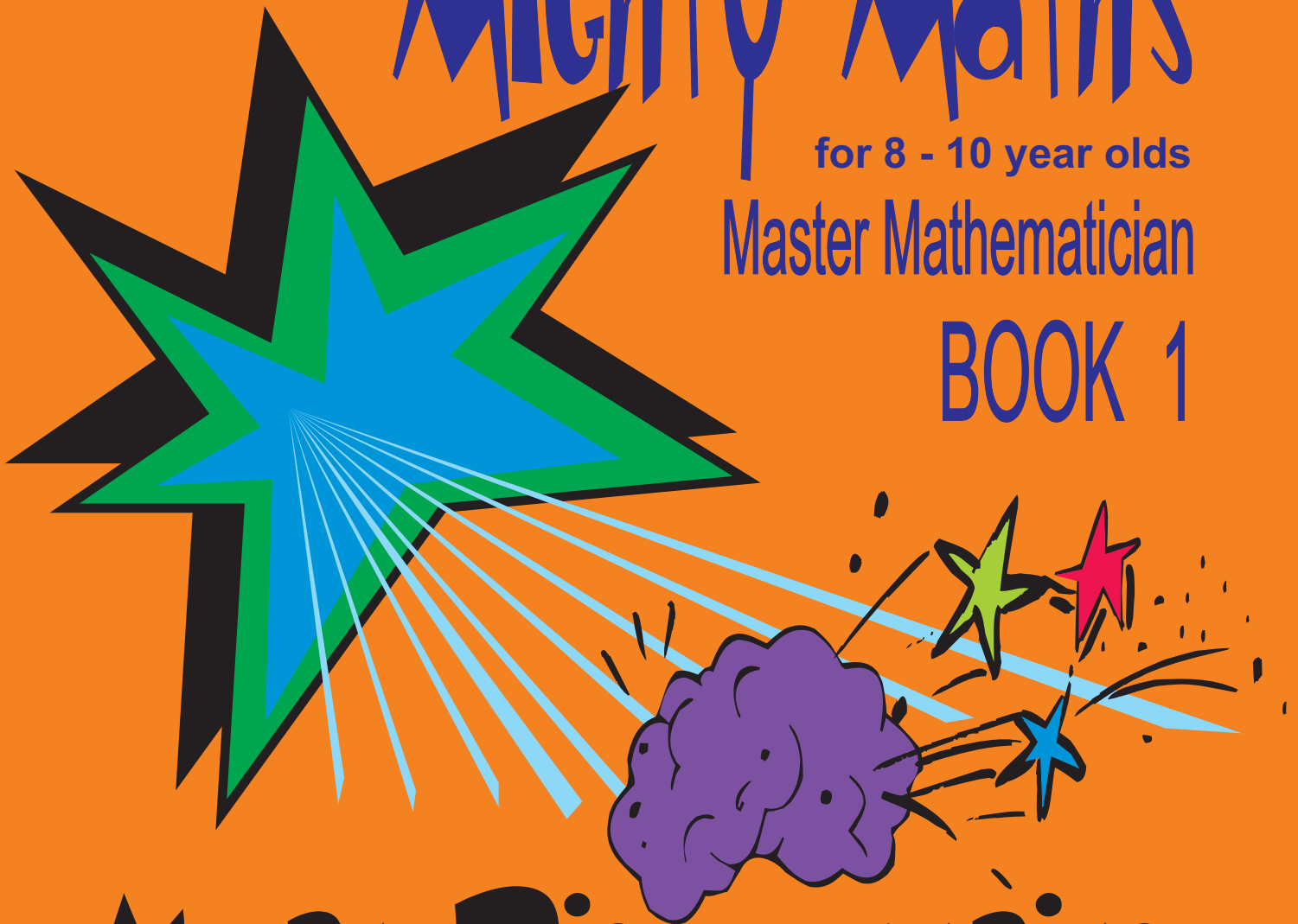


Mighty Maths

for 8 - 10 year olds

Master Mathematician

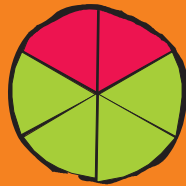
BOOK 1



MORE DISCOVERIES



$$\frac{1}{3} = \frac{2}{6}$$



With

MATHEMATICS

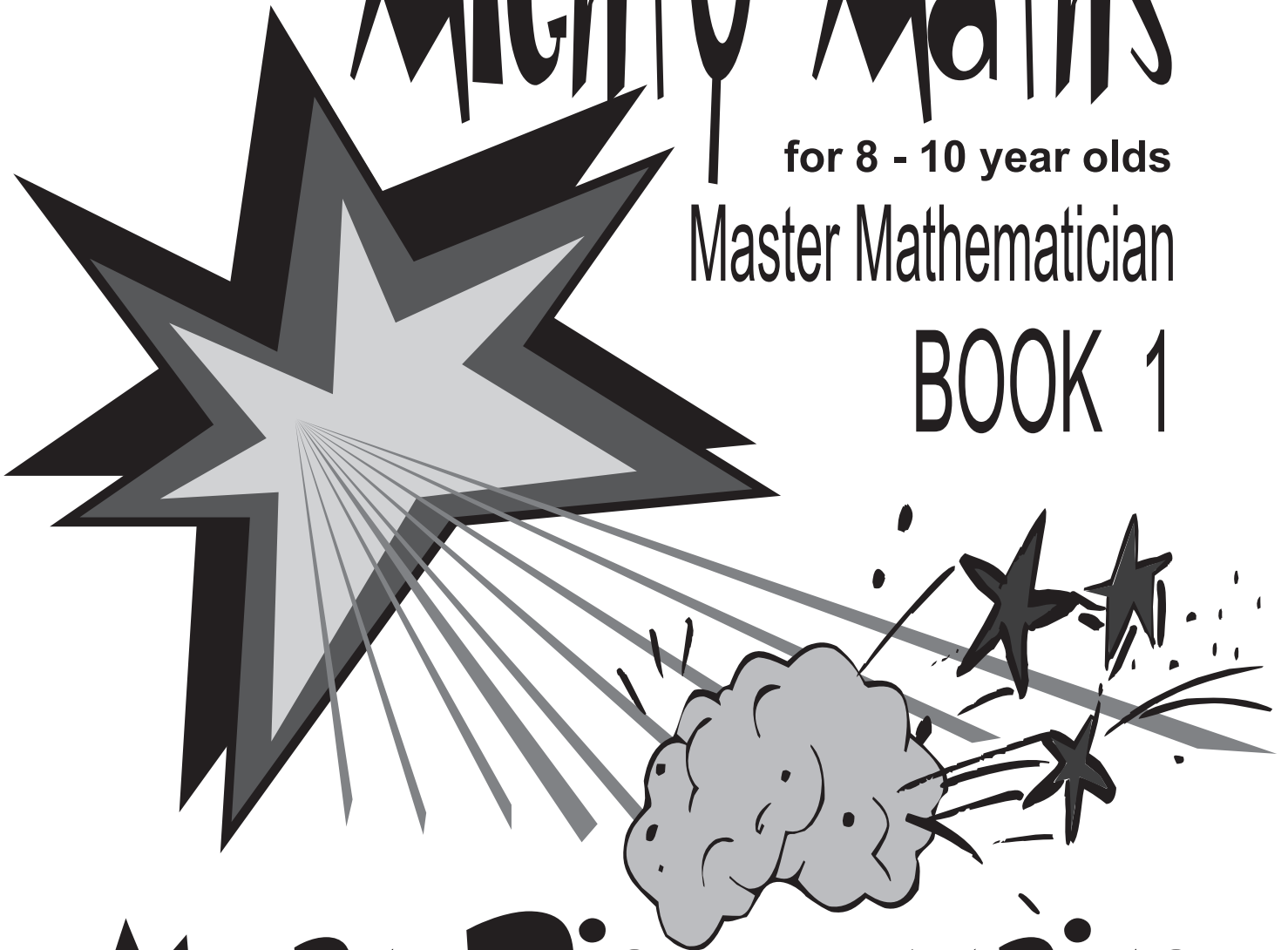
Kim Freeman

Mighty Maths

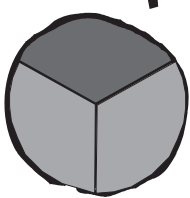
for 8 - 10 year olds

Master Mathematician

BOOK 1



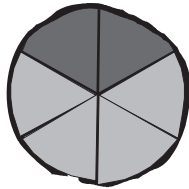
MORE Discoveries



$$\frac{1}{3}$$

=

$$\frac{2}{6}$$



With

Mathematics

Kim Freeman

Mighty Maths for Mighty Maths for 8-10 year olds - Master Mathematician Book 1
More Discoveries with Mathematics
Author, K. Freeman

eBook published in New Zealand in 2011 by:
Mahobe Resources (NZ) Ltd
P.O. Box 109-760
Newmarket, Auckland
New Zealand.

© Mahobe Resources (NZ) Ltd.
ISBN 9781877489204

Print Production by Imago Print Productions (F.E.) Pte. Ltd., Singapore.

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HOW CAN YOU HELP YOUR CHILD IN MATHEMATICS?

As you progress through the school years, mathematics becomes slightly more complex but even more fascinating. There are many new concepts to learn, however being able to master the basics is still the key to developing confidence and being able to progress further.

This orange Mighty Maths series, Master Mathematician, introduces a number of new concepts such as adding and subtracting larger numbers, arithmetic order of operation and integers. Other topics such as number, decimals and fractions are expanded upon. The work is progressively more challenging and new concepts are introduced in each book at various points.

To help reinforce mathematical skills as well as to maintain motivation, the same type of question is asked in different ways and contexts. Don't worry if your child cannot understand one of the concepts. Quite often that same concept will be introduced in a different way later on in the book. If your child becomes comfortable with a particular way of solving a problem then let them carry on using this method.

A common question that is asked of mathematics teachers is whether a child should use a calculator at this stage of their learning. It is important that they learn and understand each basic concept and the underlying principles. Once that is achieved then there is a case for using the calculator so that they can further explore ways of solving the same problem and therefore increasing their understanding a lot quicker.

This specific book covers numbers to 1000 and the place value of each of the digits. It then devotes a number of pages to column arithmetic, basic fraction work and gives some initial multiplication strategies and exercises to practise on.

For best results:

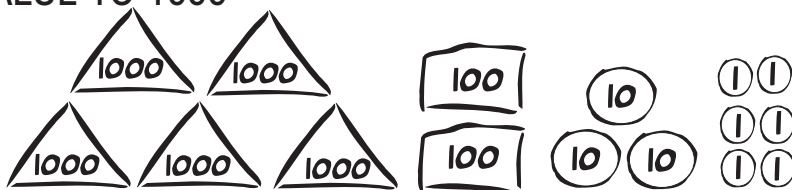
- Go over the pages that your child will work on and familiarise yourself with the exercises. Make sure your children understand the different concepts. Try and explain what is happening on each of the pages.
- Encourage your children to write neatly. Many errors in solving mathematics problems can be traced back to sloppy number writing.
- Provide help immediately when needed. Mathematics is a subject in which everything builds upon what has been previously learned. For example, a failure to understand fractions and decimals will lead to problems later with percentages.

We hope that you and your children have fun with Mighty Maths. At Mahobe, we certainly had fun putting it all together and trialling it with 8-10 year olds.

What is found in this book?

In this book you look at:

NUMBERS AND PLACE VALUE TO 1000



ARITHMETIC STRATEGIES

$$\begin{array}{r}
 249 \\
 + 173 \\
 \hline
 \end{array}
 \rightarrow
 \begin{array}{r}
 200 + 40 + 9 \\
 100 + 70 + 3 \\
 \hline
 300 + 110 + 12
 \end{array}$$

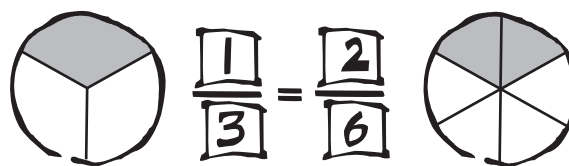
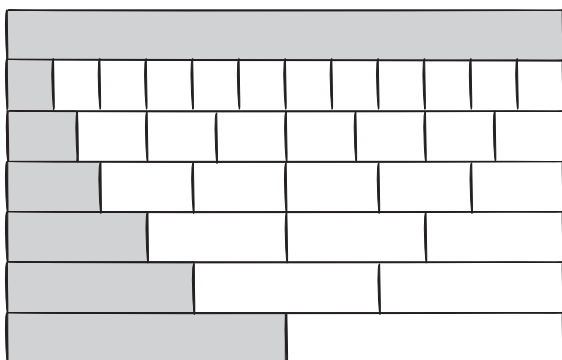
$$\begin{array}{r}
 295 \\
 + 362 \\
 \hline
 57
 \end{array}$$

90 + 60 = 150
(1 hundred + 5 tens)

$$\begin{array}{r}
 824 \\
 - 396 \\
 \hline
 \end{array}$$

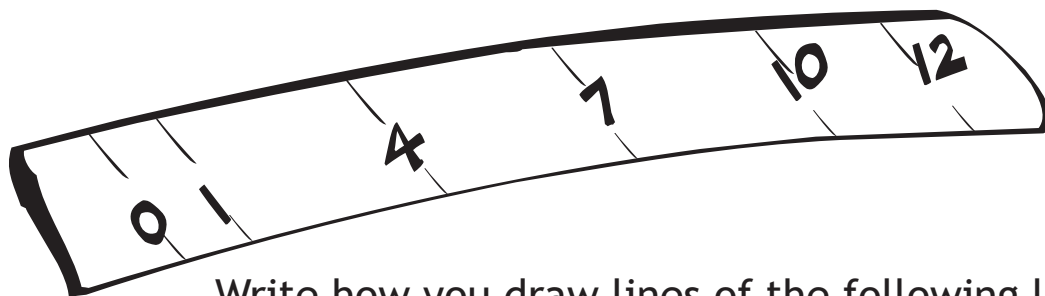
You cannot subtract 6 from 4.

FRACTIONS



THE MIGHTY RULER

The ruler shown below is a bit different to others. However you can still draw lines for any of the measurements from 1 to 12 cm.



Write how you draw lines of the following lengths.

2 cm..... *Use the distance between 10 and 12 cm.*

3 cm.....

5 cm.....

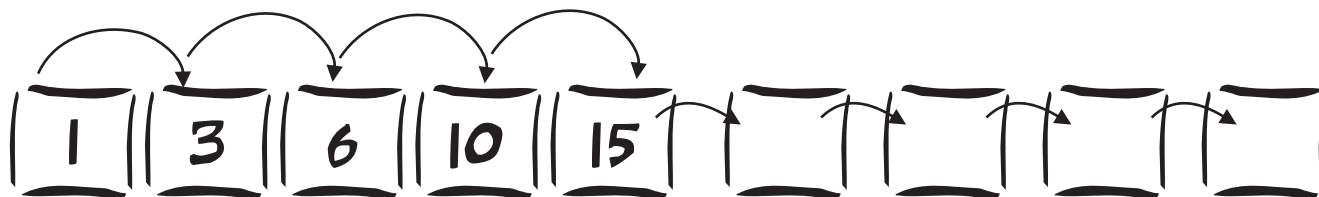
6 cm.....

8 cm.....

9 cm.....

11 cm

Find the pattern then write the next 4 numbers.



BRAIN EXTENSIONS



Find the pattern and complete the missing pieces.

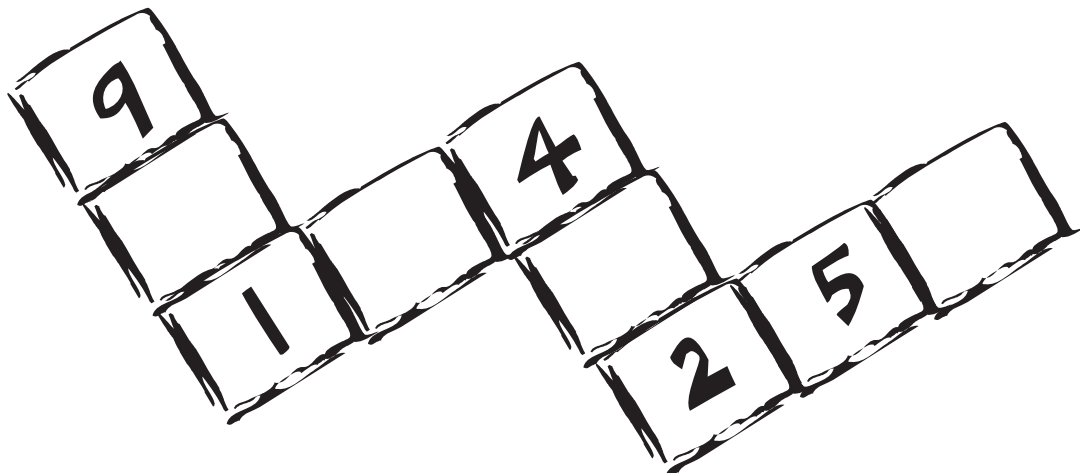
8	11	10			11		14
5	7	8		9		11	
3	4	2	7	5			
15	28	16	42		28	66	48

There are two ways of using 9 8 7 6 5 4 3 2 1 and the + sign to get a sum total equal to 99. Below is the one of the ways:

$$9 + 8 + 7 + 65 + 4 + 3 + 2 + 1 = 99$$

Write the other sum.

The numbers 1 to 9 can be put into these squares so that each set of 3 numbers adds to the same sum. Put the missing numbers into the correct squares.



ODDS AND EVENS

Are these numbers odd or even?

35 Odd
 Even

43 Odd
 Even

52 Odd
 Even

94 Odd
 Even

71 Odd
 Even

60 Odd
 Even

36 Odd
 Even

87 Odd
 Even

18 Odd
 Even

29 Odd
 Even

Which of these numbers can you divide exactly by 2? Give a ✓ for yes or a ✗ for no. Indicate whether they are odd or even.

27 ✗ 46 33 50 89 68
ODD _____

The last digit tells you if a number is odd or even.

If the last digit is 1, 3, 5, 7 or 9 then the number is

If the last digit is,,,, or, then the number is even.

PLACE VALUE

Write in the answers.

8514 is a 4 digit number. It is made up of thousands
 hundreds, ten and units or ones.

In the number 3902 the digit 9 stands for

In the number 6375 the digit 6 stands for

1783 is a 4 digit number. It is made up of one
 seven eight and 3

Write the greatest and the smallest numbers
 that can be obtained from each set of cards.

3	9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2	7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8	2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6	0	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
9	5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Write down the digit value.

4520

↪ Five hundred

3768

↪

9103

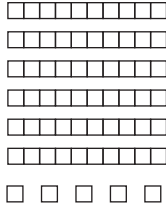
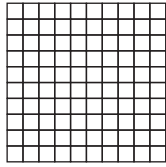
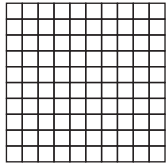
↪

2300

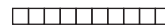
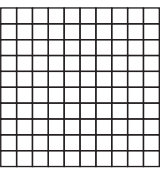
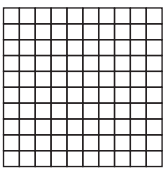
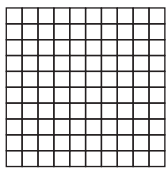
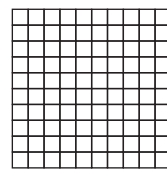
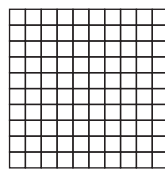
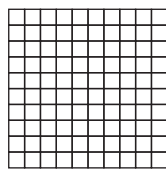
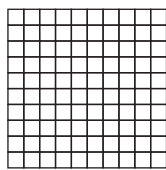
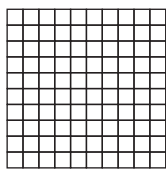
↪

NUMBERS TO 1000

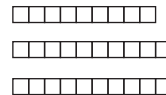
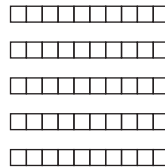
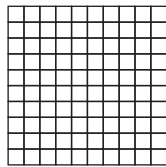
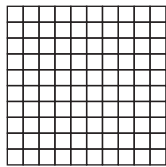
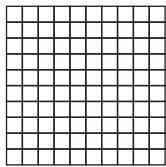
Write down the number that each picture represents.



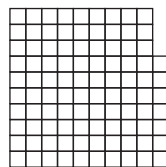
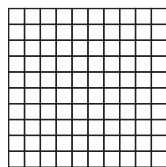
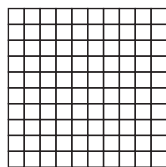
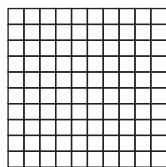
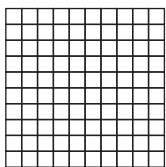
.....



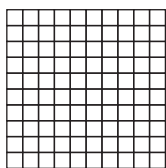
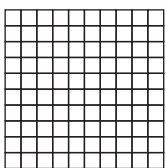
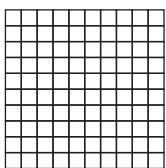
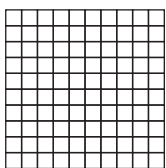
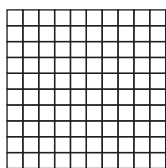
.....



.....



.....



□

PLACE VALUE

Write the correct number.

3 thousands, 2 hundreds, 2 tens, 3 ones =

TH	H	T	U

6 thousands, 4 hundreds, 4 tens, 4 ones =

TH	H	T	U

1 thousand, 5 hundreds, 1 ten, 4 ones =

TH	H	T	U

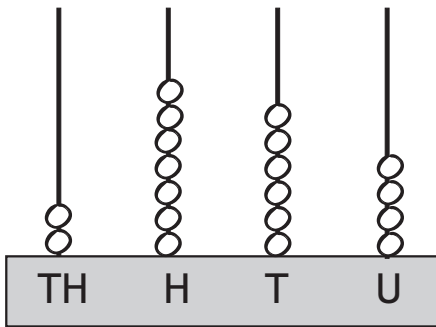
2 thousands, 6 hundreds, 3 ones =

TH	H	T	U

2 thousands, 5 ones =

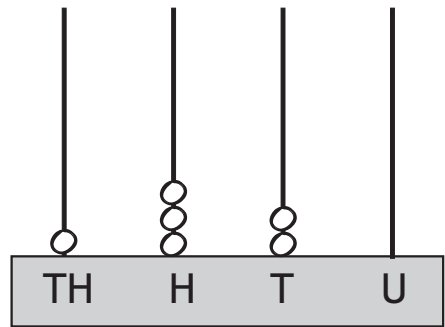
TH	H	T	U

Write the number and the number word.

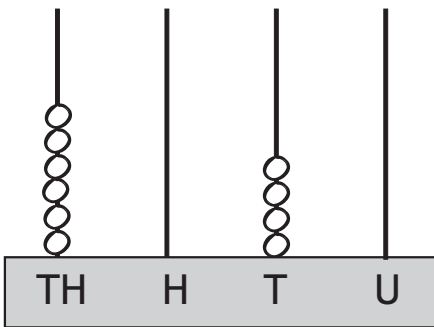


2764

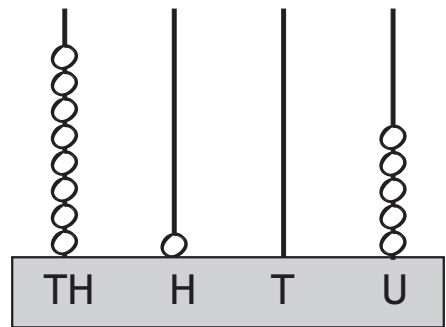
Two thousand seven hundred and sixty four



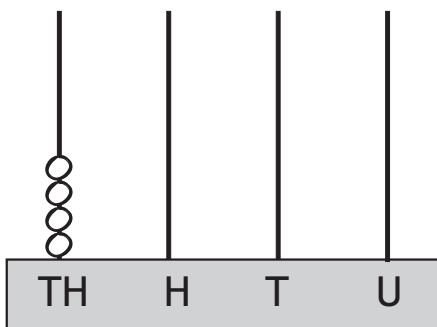
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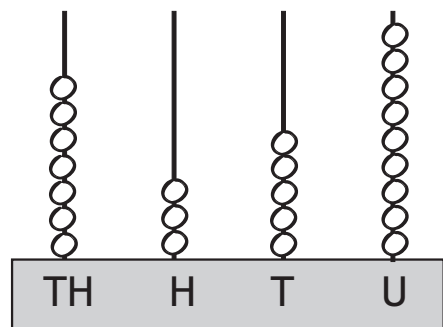
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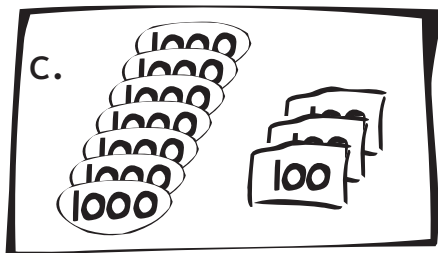
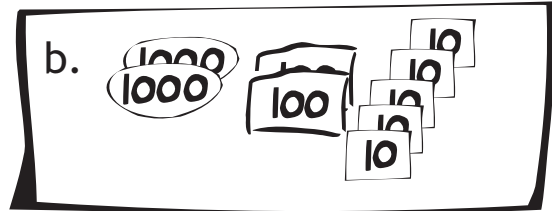
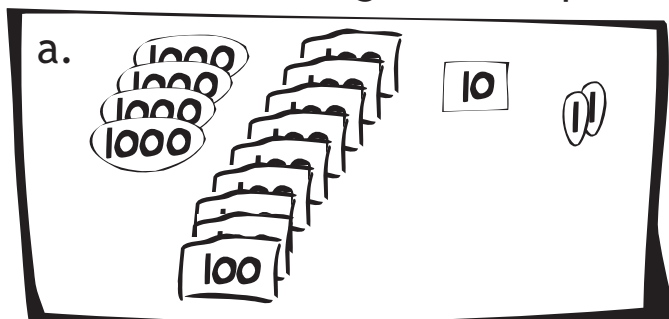
.....



.....

PLACE VALUE

Write each as digits in the place-value table.



	TH	H	T	U
a.				
b.				
c.				

Write these numbers with words.

6024 _____

5109 _____

8372 _____

3680 _____

Write these as expanded numbers.

$$4569 = 4 \times 1000 + 5 \times 100 + 6 \times 10 + 9 \times 1$$

$$1800 =$$

$$3705 =$$

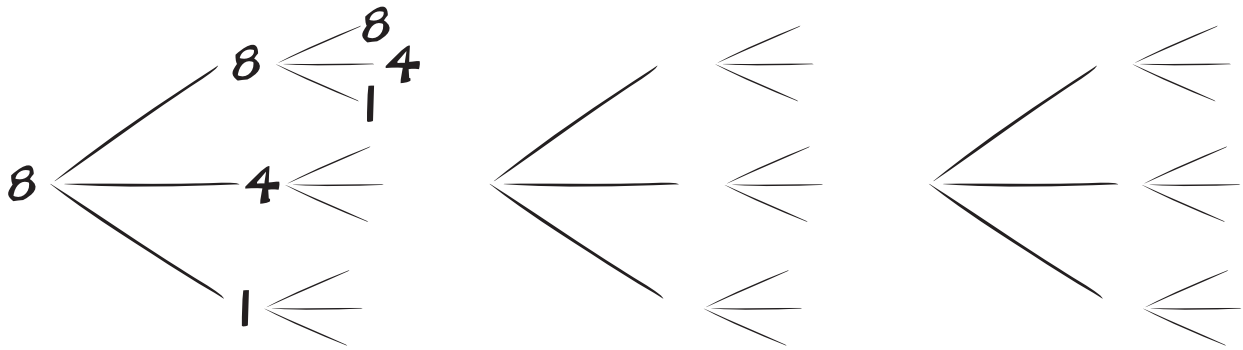
$$9253 =$$

$$7408 =$$

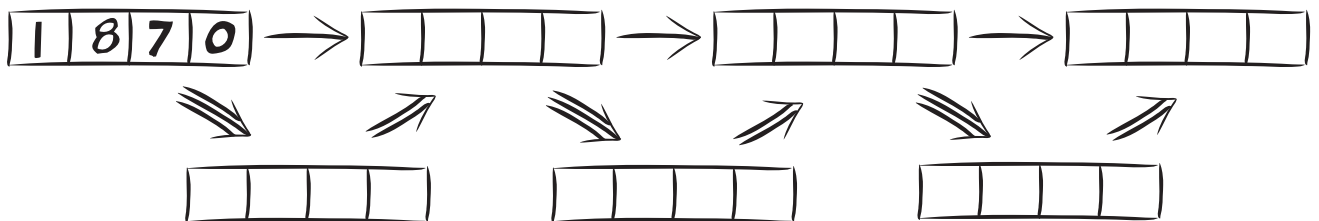
$$291 =$$

How many 3-digit numbers can be made from **841** ?

Complete the tree diagrams then list the numbers in descending order.



Complete the missing numbers if \searrow means +10 and \swarrow means -15.



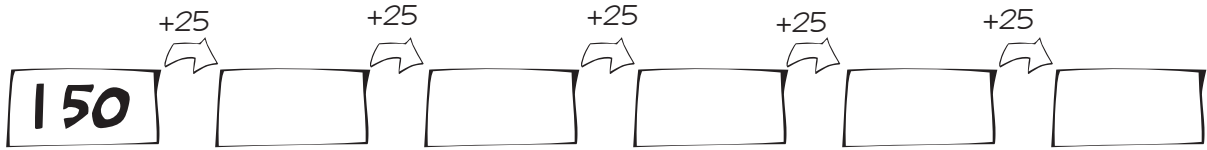
What does the \rightarrow mean? _____

Add 1, 10, 100 and 1000 to the numbers in the table.

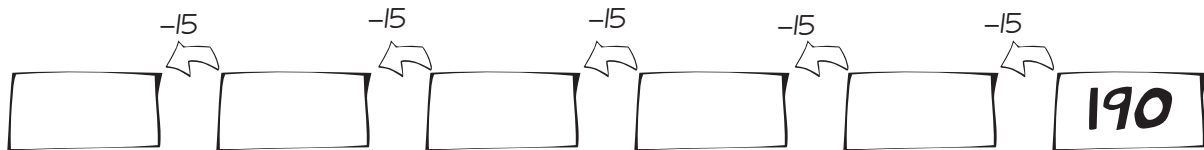
	+1	+10	+100	+1000
69				
1955				
3290				
9999				

ARITHMETIC

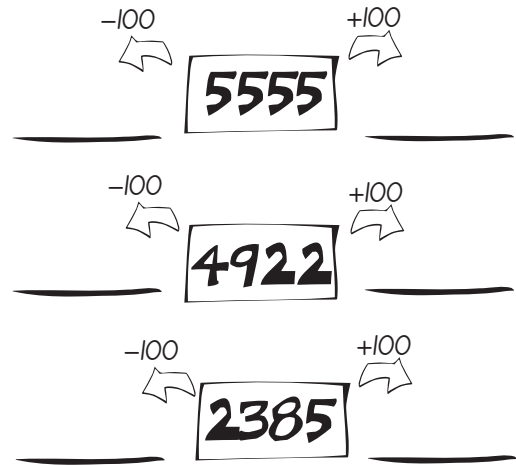
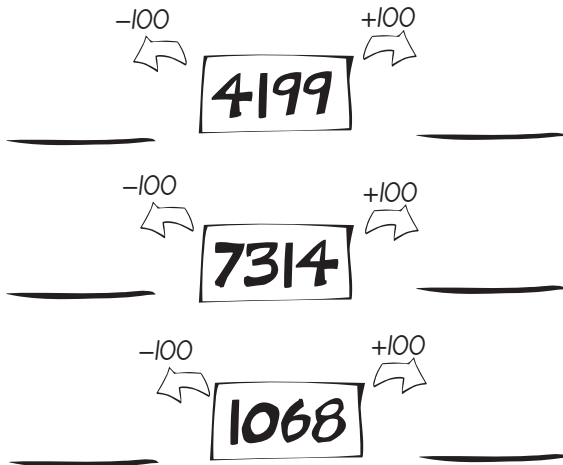
Add 25 to each box.



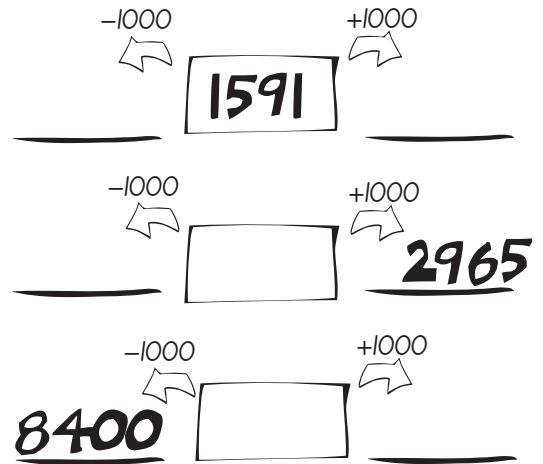
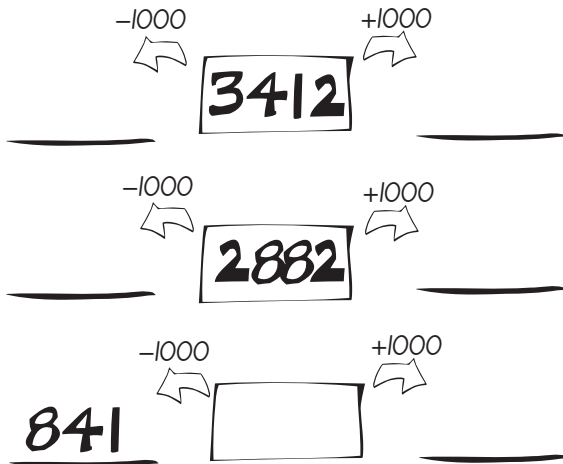
Subtract 15 from each box.



Write the numbers that are 100 more and 100 less.

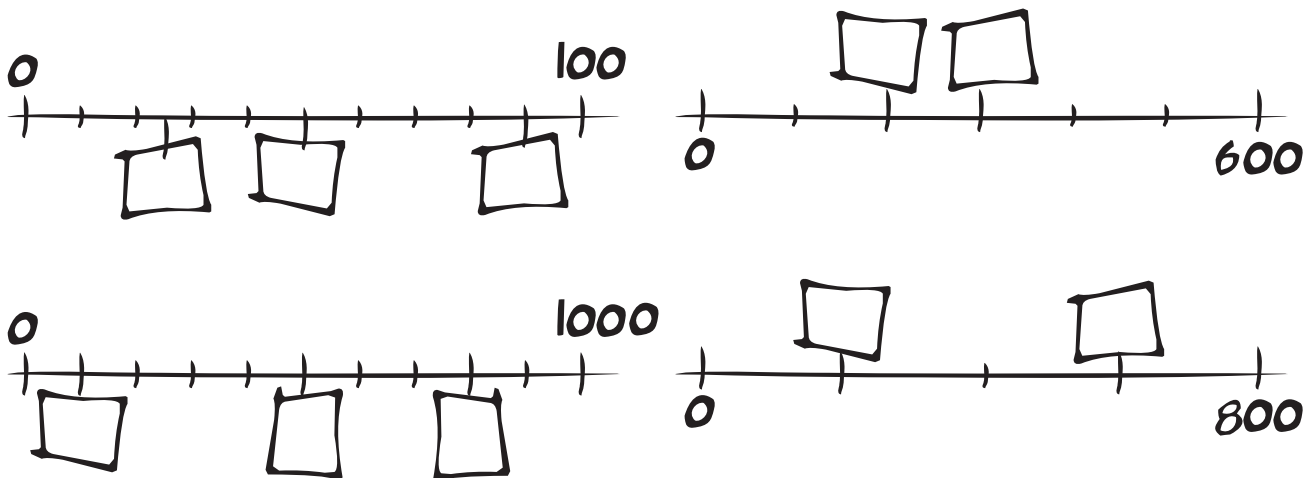


Complete these sums - 1000 more and 1000 less.



ESTIMATING

Estimate the number in each box on the number lines.



Circle the number that is closest to the number in the box.

<div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 0 auto;"> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">2500</div> 2400 2800 </div>	<div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 0 auto;"> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">9600</div> 9000 10 000 </div>	<div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 0 auto;"> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">8400</div> 8001 8800 </div>
---	---	---

Choose the best number.

2008 is approximately 20 000, 2 000, 200, 20.

8010 is slightly more than 800, 8000, 8110, 6999.

Write a number that is approximately half the number shown.

601	119	223	499
.....

..... is approximately one third of 91

..... is approximately one third of 149

SAILING AWAY

Each of the boards has one of the numbers on their sails.



- 1657
- 8325
- 3109
- 2144
- 5123
- 6218

The boat with the largest number finished last.

The sum of the digits of the numbers on the first two boards is the same.

The numbers on the 2nd and 3rd boards are odd.

The number on the fourth boat is twice the size of the number on the fifth.

Write the correct numbers on each sail.

Write the correct digits in the boxes.

TH	H	T	U

Four thousand eight hundred.

Two thousand and five.

One thousand six hundred and seven.

Nine thousand one hundred and twelve.

PARTITIONING NUMBERS

Write in the missing digits.

$$1745 = \boxed{}\boxed{}\boxed{}\boxed{} + 700 + \boxed{}\boxed{} + \boxed{}$$

$$7268 = \boxed{}\boxed{}\boxed{}\boxed{} + \boxed{}\boxed{}\boxed{} + 60 + \boxed{}$$

$$4312 = 4000 + \boxed{}\boxed{}\boxed{} + \boxed{}\boxed{} + \boxed{}$$

$$3591 = \boxed{}\boxed{}\boxed{}\boxed{} + \boxed{}\boxed{}\boxed{} + \boxed{}\boxed{} + 1$$

Now, write in the missing numbers.

$$5351 = \boxed{}\boxed{}\boxed{}\boxed{} + 300 + 50 + 1$$

$$8267 = 8000 + \boxed{}\boxed{}\boxed{} + 60 + \boxed{}$$

$$2492 = 2000 + \boxed{}\boxed{}\boxed{} + \boxed{}\boxed{} + 2$$

$$1605 = \boxed{}\boxed{}\boxed{}\boxed{} + \boxed{}\boxed{}\boxed{} + \boxed{}\boxed{} + \boxed{}$$

Finally, write the answers.

$$6000 + 100 + 80 + 3 = \boxed{}\boxed{}\boxed{}\boxed{}$$

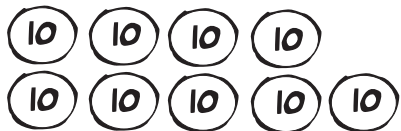
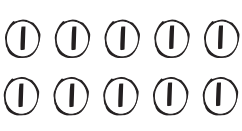
$$2000 + 600 + 60 + 4 = \boxed{}\boxed{}\boxed{}\boxed{}$$

$$5000 + 900 + 1 = \boxed{}\boxed{}\boxed{}\boxed{}$$


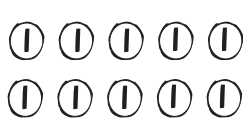
$$4000 + 10 = \boxed{}\boxed{}\boxed{}\boxed{}$$

ARITHMETIC

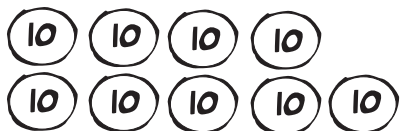
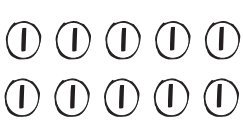
Shade the circles to give 65 then find the correct answer.



 $65 + \dots = 100$

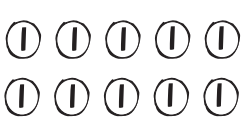
Shade the circles to give 29 then find the correct answer.



 $29 + \dots = 100$

Shade the circles to give 44 then find the correct answer.



 $44 + \dots = 100$

Shade the circles to give 83 then find the correct answer.



 $83 + \dots = 100$

Fill in the correct answer.

$20 + \dots = 100$

$40 + \dots = 100$

$70 + \dots = 100$

$10 + \dots = 100$

$25 + \dots = 100$

$85 + \dots = 100$

Fill in the correct answer.

$55 + \dots = 100$

$75 + \dots = 100$

$79 + \dots = 100$

$42 + \dots = 100$

$87 + \dots = 100$

$53 + \dots = 100$

MORE ARITHMETIC

$$6 + 6 + 6 = \text{[smiley face]} \times 2$$

$$\text{[smiley face]} = \underline{\hspace{2cm}}$$

$$10 + 10 + 10 + 10 = \text{[smiley face]} \times 5$$

$$\text{[smiley face]} = \underline{\hspace{2cm}}$$

$$8 + 8 + 8 + 8 + 8 + 8 = \text{[smiley face]} \times 3$$

$$\text{[smiley face]} = \underline{\hspace{2cm}}$$

$$9 \times 8 = \text{[smiley face]} + \text{[smiley face]}$$

$$\text{[smiley face]} = \underline{\hspace{2cm}}$$

$$6 \times \text{[smiley face]} = 54$$

therefore $\text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} = \underline{\hspace{2cm}}$

$$3 \times \text{[smiley face]} = 24$$

therefore $5 \times \text{[smiley face]} = \underline{\hspace{2cm}}$

$$6 + \text{[smiley face]} = 60$$

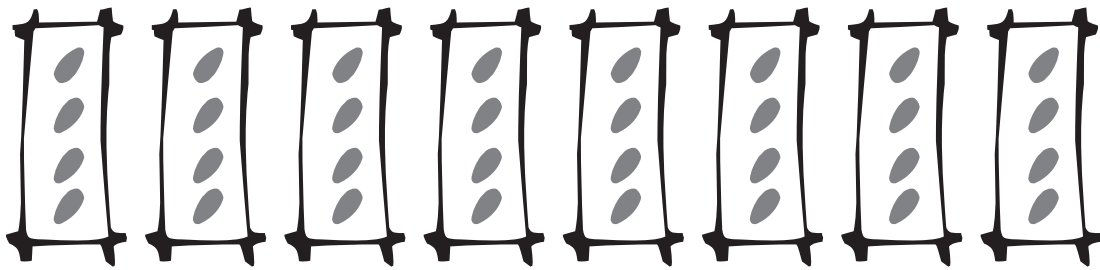
therefore $\text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} = \underline{\hspace{2cm}}$

$$\text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} + \text{[smiley face]} = 40$$

$$\text{[smiley face]} + \text{[smiley face]} = 30$$

$$\text{[smiley face]} = \underline{\hspace{2cm}} \quad \text{[smiley face]} = \underline{\hspace{2cm}}$$

Write an addition a multiplication and a division statement for this.



$$\begin{array}{|c|} \hline 4 \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} + \begin{array}{|c|} \hline \dots \\ \hline \end{array} = \begin{array}{|c|} \hline \dots \\ \hline \end{array}$$

$$\dots \times 4 = \begin{array}{|c|} \hline \dots \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline \dots \\ \hline \end{array} \div 8 = \begin{array}{|c|} \hline \dots \\ \hline \end{array}$$

Remember - division is the opposite of multiplication.

$4 \times 8 =$

$5 \times 7 =$

$9 \times 10 =$

$7 \times 8 =$

$6 \times 5 =$

$4 \times 9 =$

$8 \times 9 =$

$9 \times 3 =$

$5 \times 8 =$

$3 \times 7 =$

$6 \times 4 =$

$6 \times 8 = \begin{array}{|c|} \hline 48 \\ \hline \end{array} \begin{array}{l} \curvearrowright \\ \curvearrowleft \end{array} \begin{array}{l} 48 \div 8 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \\ 48 \div 6 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \end{array}$

$13 \times 5 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \begin{array}{l} \curvearrowright \\ \curvearrowleft \end{array} \begin{array}{l} 65 \div 5 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \\ 65 \div 13 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \end{array}$

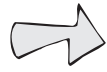
$15 \times 8 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \begin{array}{l} \curvearrowright \\ \curvearrowleft \end{array} \begin{array}{l} 120 \div 8 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \\ 120 \div 15 = \begin{array}{|c|} \hline \dots \\ \hline \end{array} \end{array}$



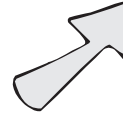
ARITHMETIC STRATEGIES

Partition the numbers then add each amount.

$$\begin{array}{r} 249 \\ + 173 \\ \hline \end{array}$$



$$\begin{array}{r} 200 + 40 + 9 \\ 100 + 70 + 3 \\ \hline 300 + 110 + 12 \end{array}$$



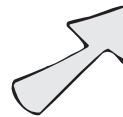
$$\begin{array}{r} 300 \\ 110 \\ 12 \\ \hline 422 \end{array}$$

These numbers are much easier to add up.

$$\begin{array}{r} 363 \\ + 279 \\ \hline \end{array}$$



$$\begin{array}{r} 300 + 60 + 3 \\ 200 + 70 + 9 \\ \hline \end{array}$$

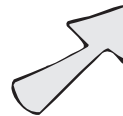


$$\begin{array}{r} \hline \hline \end{array}$$

$$\begin{array}{r} 628 \\ + 99 \\ \hline \end{array}$$



$$\hline$$

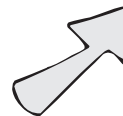


$$\begin{array}{r} \hline \hline \end{array}$$

$$\begin{array}{r} 336 \\ + 73 \\ \hline \end{array}$$



$$\hline$$

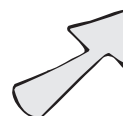


$$\begin{array}{r} \hline \hline \end{array}$$

$$\begin{array}{r} 867 \\ + 59 \\ \hline \end{array}$$



$$\hline$$



$$\begin{array}{r} \hline \hline \end{array}$$

Partition the numbers then add each amount.

$$458 + 122$$

400	+	100	=	500
50	+	20	=	70
8	+	2	=	10
				<hr/>
				580

$$275 + 125$$

$$755 + 165$$

$$195 + 135$$

$$227 + 165$$

$$644 + 253$$

$$385 + 287$$

$$358 + 219$$

$$109 + 95$$

$$575 + 171$$

ADDITION IN COLUMNS

LEVEL 1

Add each column
- units, tens, hundreds and thousands.

Step 1.

$$\begin{array}{r} 458 \\ + 421 \\ \hline \end{array}$$

8 + 1 = 9

Step 2.

$$\begin{array}{r} 458 \\ + 421 \\ \hline \end{array}$$

50 + 20 = 70

Step 3.

$$\begin{array}{r} 458 \\ + 421 \\ \hline \end{array}$$

400 + 400 = 800

$$\begin{array}{r} 164 \\ + 323 \\ \hline \end{array}$$

$$\begin{array}{r} 492 \\ + 401 \\ \hline \end{array}$$

$$\begin{array}{r} 385 \\ + 212 \\ \hline \end{array}$$

$$\begin{array}{r} 530 \\ + 104 \\ \hline \end{array}$$

$$\begin{array}{r} 768 \\ + 121 \\ \hline \end{array}$$

$$\begin{array}{r} 7114 \\ + 2031 \\ \hline \end{array}$$

$$\begin{array}{r} 5241 \\ + 1217 \\ \hline \end{array}$$

$$\begin{array}{r} 6042 \\ + 2915 \\ \hline \end{array}$$

$$\begin{array}{r} 3729 \\ + 2040 \\ \hline \end{array}$$

$$\begin{array}{r} 553 \\ +216 \\ \hline \end{array}$$

Answer the questions then crack the code.

K

$$\begin{array}{r} 132 \\ +132 \\ \hline \end{array}$$

$$\begin{array}{r} 2141 \\ +4632 \\ \hline \end{array}$$

$$\begin{array}{r} 512 \\ +327 \\ \hline \end{array}$$

A

D

O

$$\begin{array}{r} 385 \\ +212 \\ \hline \end{array}$$

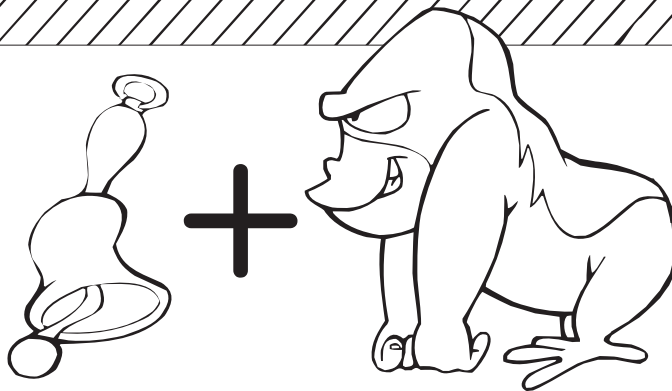
$$\begin{array}{r} 243 \\ +651 \\ \hline \end{array}$$

$$\begin{array}{r} 8951 \\ +1010 \\ \hline \end{array}$$

I

G

N



What do you get if you cross a bell with a large gorilla?

264

6773	597	9961	894

6773	839	9961	894

769	597	9961	894

769	839	9961	894

ADDITION IN COLUMNS

LEVEL 2

Add each column
- units, tens, hundreds and thousands.

Step 1.

$$\begin{array}{r} 327 \\ + 525 \\ \hline 2 \end{array}$$

$7 + 5 = 12$
(1 ten + 2 units)

Step 2.

$$\begin{array}{r} 327 \\ + 525 \\ \hline 52 \end{array}$$

$20 + 20 + 10 = 50$

Step 3.

$$\begin{array}{r} 327 \\ + 525 \\ \hline 852 \end{array}$$

$300 + 500 = 800$

$$\begin{array}{r} 485 \\ + 106 \\ \hline \end{array}$$

$$\begin{array}{r} 238 \\ + 245 \\ \hline \end{array}$$

$$\begin{array}{r} 575 \\ + 217 \\ \hline \end{array}$$

$$\begin{array}{r} 819 \\ + 136 \\ \hline \end{array}$$

$$\begin{array}{r} 623 \\ + 157 \\ \hline \end{array}$$

$$\begin{array}{r} 2758 \\ + 4118 \\ \hline \end{array}$$

$$\begin{array}{r} 7336 \\ + 1207 \\ \hline \end{array}$$

$$\begin{array}{r} 5219 \\ + 1435 \\ \hline \end{array}$$

$$\begin{array}{r} 1197 \\ + 2008 \\ \hline \end{array}$$

Answer the questions then crack the code.

$$\begin{array}{r} 145 \\ +109 \\ \hline \end{array}$$

C



$$\begin{array}{r} 578 \\ +215 \\ \hline \end{array}$$

A

$$\begin{array}{r} 756 \\ +128 \\ \hline \end{array}$$

H

$$\begin{array}{r} 517 \\ +134 \\ \hline \end{array}$$

U

$$\begin{array}{r} 337 \\ +116 \\ \hline \end{array}$$

E

$$\begin{array}{r} 107 \\ +505 \\ \hline \end{array}$$

R

$$\begin{array}{r} 1428 \\ +2007 \\ \hline \end{array}$$

L

$$\begin{array}{r} 2177 \\ +4113 \\ \hline \end{array}$$

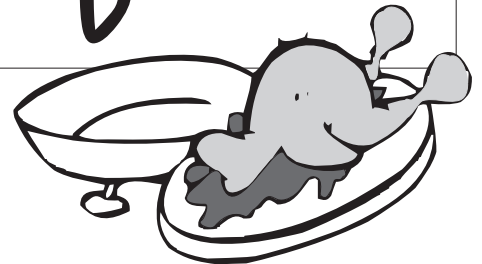
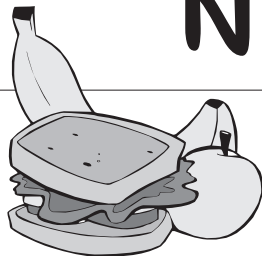
I

$$\begin{array}{r} 4344 \\ +2108 \\ \hline \end{array}$$

N

$$\begin{array}{r} 7529 \\ +1149 \\ \hline \end{array}$$

D



What are two things you cannot eat for breakfast?

3435	651	6452	254	884

793	6452	8678

8678	6290	6452	6452	453	612

ADDITION IN COLUMNS

LEVEL 3

Add each column
- units, tens, hundreds and thousands.

Step 1.

$$\begin{array}{r} 295 \\ + 362 \\ \hline 7 \end{array}$$

$5 + 2 = 7$

Step 2.

$$\begin{array}{r} 295 \\ + 362 \\ \hline 57 \end{array}$$

$90 + 60 = 150$
(1 hundred + 5 tens)

Step 3.

$$\begin{array}{r} 295 \\ + 362 \\ \hline 657 \end{array}$$

$200 + 300 + 100 = 600$

$$\begin{array}{r} 389 \\ + 260 \\ \hline \end{array}$$

$$\begin{array}{r} 382 \\ + 342 \\ \hline \end{array}$$

$$\begin{array}{r} 575 \\ + 171 \\ \hline \end{array}$$

$$\begin{array}{r} 491 \\ + 136 \\ \hline \end{array}$$

$$\begin{array}{r} 673 \\ + 251 \\ \hline \end{array}$$

$$\begin{array}{r} 2781 \\ + 4158 \\ \hline \end{array}$$

$$\begin{array}{r} 2363 \\ + 1207 \\ \hline \end{array}$$

$$\begin{array}{r} 2291 \\ + 435 \\ \hline \end{array}$$

$$\begin{array}{r} 2297 \\ + 80 \\ \hline \end{array}$$

$$\begin{array}{r} 266 \\ + 151 \\ \hline \end{array}$$

Y

$$\begin{array}{r} 342 \\ + 160 \\ \hline \end{array}$$

O

$$\begin{array}{r} 471 \\ + 372 \\ \hline \end{array}$$

H

$$\begin{array}{r} 695 \\ + 222 \\ \hline \end{array}$$

G

$$\begin{array}{r} 583 \\ + 241 \\ \hline \end{array}$$

U

$$\begin{array}{r} 114 \\ + 292 \\ \hline \end{array}$$

I

$$\begin{array}{r} 340 \\ + 388 \\ \hline \end{array}$$

N

$$\begin{array}{r} 765 \\ + 182 \\ \hline \end{array}$$

L

$$\begin{array}{r} 3240 \\ + 1260 \\ \hline \end{array}$$

W

$$\begin{array}{r} 2176 \\ + 1262 \\ \hline \end{array}$$

E

$$\begin{array}{r} 5094 \\ + 2082 \\ \hline \end{array}$$

R

$$\begin{array}{r} 4365 \\ + 261 \\ \hline \end{array}$$



What did the hat say to the scarf?



D

417	502	824	843	1831	728	917	

$$\begin{array}{r} 1441 \\ + 390 \\ \hline \end{array}$$

A

1831	7176	502	824	728	4626

4500	843	406	947	3438	406	917	502

502	728

1831	843	3438	1831	4626

ADDITION IN COLUMNS

LEVEL 4

Add each column
- units, tens, hundreds and thousands.

Step 1.

$$\begin{array}{r} 295 \\ + 147 \\ \hline \end{array}$$

$$5 + 7 = 12$$

(1 ten + 2 units)

Step 2.

$$\begin{array}{r} 295 \\ + 147 \\ \hline \end{array}$$

$$90 + 40 + 10 = 140$$

(1 hundred + 4 tens)

Step 3.

$$\begin{array}{r} 295 \\ + 147 \\ \hline \end{array}$$

$$200 + 100 + 100 = 400$$

$$\begin{array}{r} 469 \\ + 277 \\ \hline \end{array}$$

$$\begin{array}{r} 275 \\ + 335 \\ \hline \end{array}$$

$$\begin{array}{r} 276 \\ + 176 \\ \hline \end{array}$$

$$\begin{array}{r} 298 \\ + 146 \\ \hline \end{array}$$

$$\begin{array}{r} 184 \\ + 239 \\ \hline \end{array}$$

$$\begin{array}{r} 698 \\ + 212 \\ \hline \end{array}$$

A

$$\begin{array}{r} 305 \\ + 598 \\ \hline \end{array}$$

K

$$\begin{array}{r} 421 \\ + 199 \\ \hline \end{array}$$

N

$$\begin{array}{r} 545 \\ + 385 \\ \hline \end{array}$$

Y

$$\begin{array}{r} 198 \\ + 664 \\ \hline \end{array}$$

C

$$\begin{array}{r} 408 \\ + 198 \\ \hline \end{array}$$

M

$$\begin{array}{r} 436 \\ + 378 \\ \hline \end{array}$$

P

$$\begin{array}{r} 287 \\ + 476 \\ \hline \end{array}$$

D

$$\begin{array}{r} 199 \\ + 156 \\ \hline \end{array}$$

$$\begin{array}{r} 776 \\ + 156 \\ \hline \end{array}$$

$$\begin{array}{r} 187 \\ + 239 \\ \hline \end{array}$$

$$\begin{array}{r} 897 \\ + 37 \\ \hline \end{array}$$

$$\begin{array}{r} 119 \\ + 299 \\ \hline \end{array}$$

$$\begin{array}{r} 754 \\ + 169 \\ \hline \end{array}$$

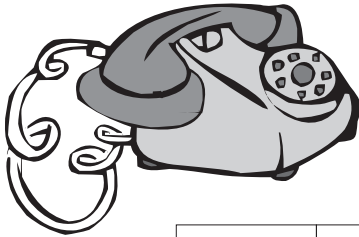
$$\begin{array}{r} 553 \\ + 358 \\ \hline \end{array}$$

$$\begin{array}{r} 287 \\ + 194 \\ \hline \end{array}$$

Why are there so many Smiths in the phone directory?

911	923	481	930

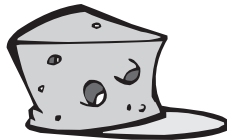
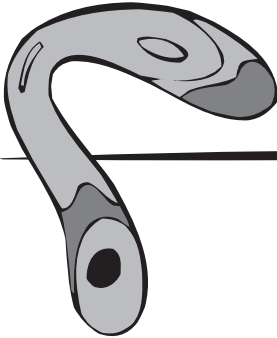
910	426	426



923	910	355	481

814	923	932	620	481	934

What cheese is made backwards?



481	763	910	606

What do you call a boomerang that doesn't work?

910	934	911	418	862	903

ADDITION IN COLUMNS

LEVEL 5

B
$$\begin{array}{r} 5763 \\ + 3489 \\ \hline \end{array}$$

G
$$\begin{array}{r} 6978 \\ + 1538 \\ \hline \end{array}$$

I
$$\begin{array}{r} 6626 \\ + 1497 \\ \hline \end{array}$$

Y
$$\begin{array}{r} 2893 \\ + 1107 \\ \hline \end{array}$$

A
$$\begin{array}{r} 6485 \\ + 2626 \\ \hline \end{array}$$

H
$$\begin{array}{r} 2985 \\ + 2149 \\ \hline \end{array}$$

D
$$\begin{array}{r} 3499 \\ + 2746 \\ \hline \end{array}$$

W
$$\begin{array}{r} 1487 \\ + 2538 \\ \hline \end{array}$$

U
$$\begin{array}{r} 2786 \\ + 3578 \\ \hline \end{array}$$

T
$$\begin{array}{r} 4959 \\ + 359 \\ \hline \end{array}$$

O
$$\begin{array}{r} 1954 \\ + 789 \\ \hline \end{array}$$

L
$$\begin{array}{r} 3568 \\ + 799 \\ \hline \end{array}$$

$$\begin{array}{r} M \\ 6787 \\ + 756 \\ \hline \end{array}$$

$$\begin{array}{r} S \\ 8997 \\ + 298 \\ \hline \end{array}$$

$$\begin{array}{r} N \\ 5568 \\ + 456 \\ \hline \end{array}$$

$$\begin{array}{r} E \\ 501 \\ + 499 \\ \hline \end{array}$$

What did one eye say to the other eye?

9252	1000	5318	4025	1000	1000	6024

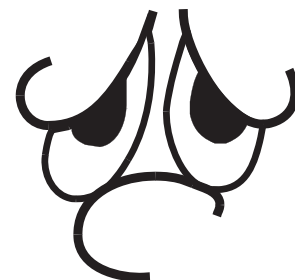
4000	2743	6364

9111	6024	6245

7543	1000

9295	2743	7543	1000	5318	5134	8123	6024	8516

9295	7543	1000	4367	4367	9295

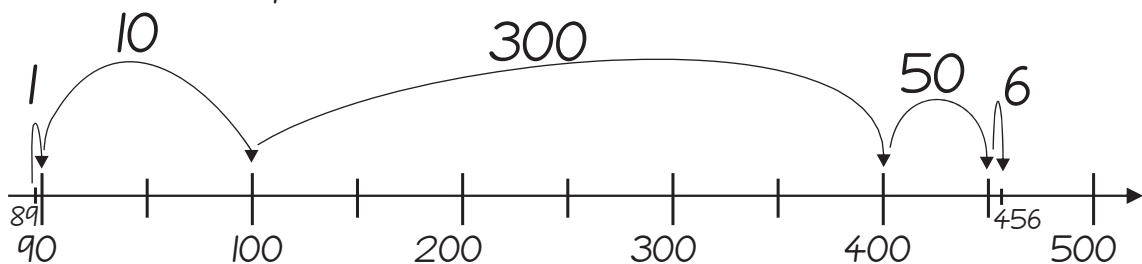


SUBTRACTION STRATEGIES

$$\begin{array}{r} 456 \\ - 89 \\ \hline \end{array}$$

The equation is asking “What is the difference between 456 and 89?”

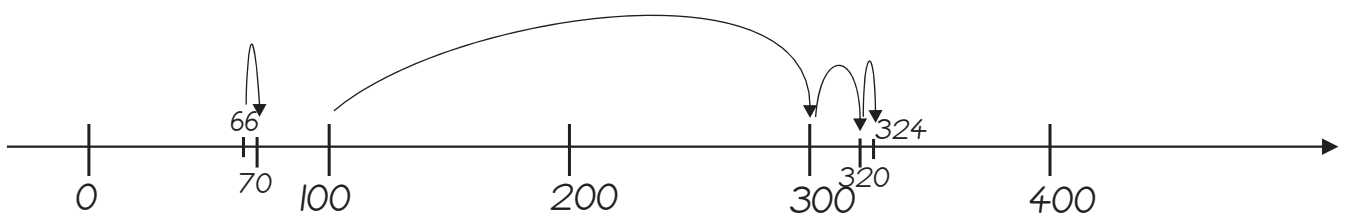
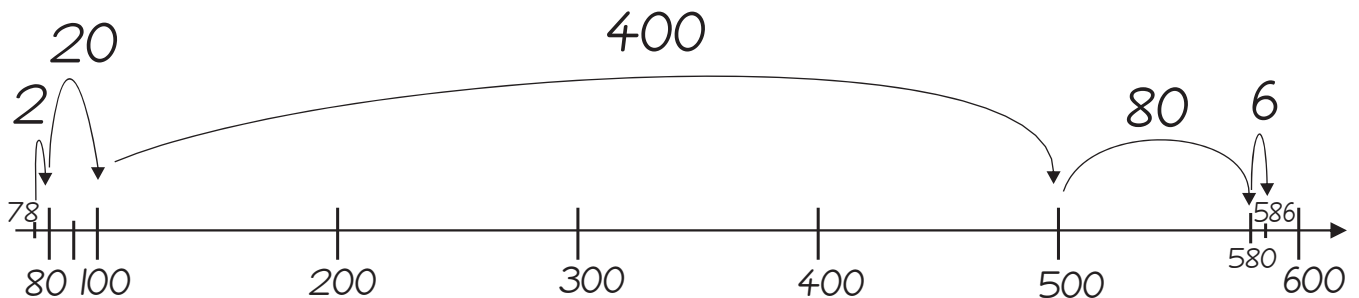
- | | |
|------------|---------------------------------------|
| 1 | Add 1 to 89 to get 90 |
| 10 | Add 10 to 90 to get 100 |
| 300 | Add 300 to 100 to get 400 |
| 50 | Add 50 to 400 to get 450 |
| 6 | Add 6 to 450 to get 456 |
| <u>367</u> | Add up all the numbers from 89 to 456 |



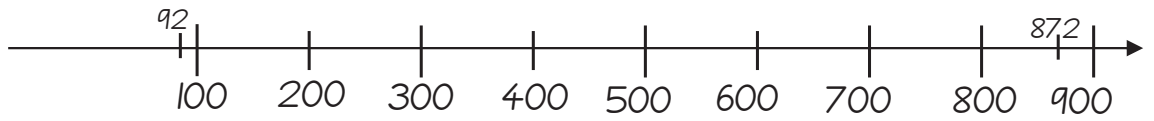
Try these subtraction sums. Use the number lines below to help.

$$\begin{array}{r} 586 \\ - 78 \\ \hline \end{array}$$

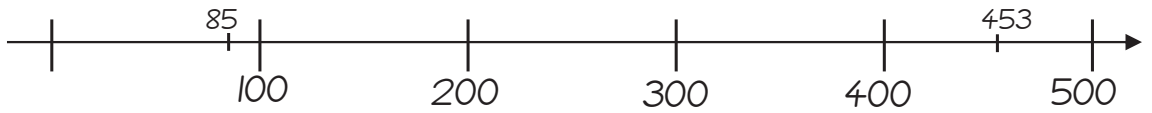
$$\begin{array}{r} 324 \\ - 66 \\ \hline \end{array}$$



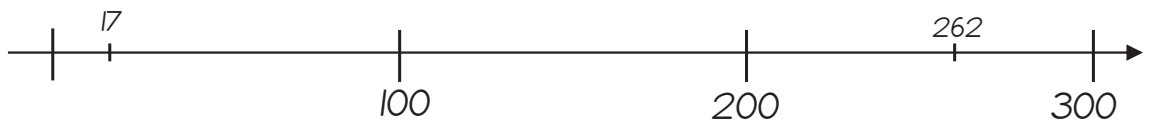
$$\begin{array}{r} 872 \\ - 92 \\ \hline \end{array}$$



$$\begin{array}{r} 453 \\ - 85 \\ \hline \end{array}$$

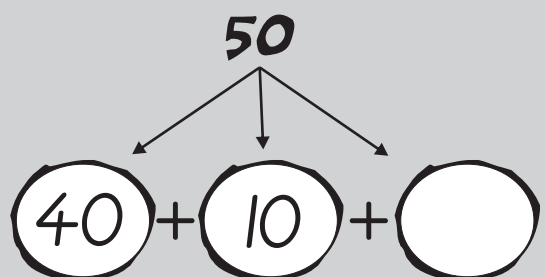
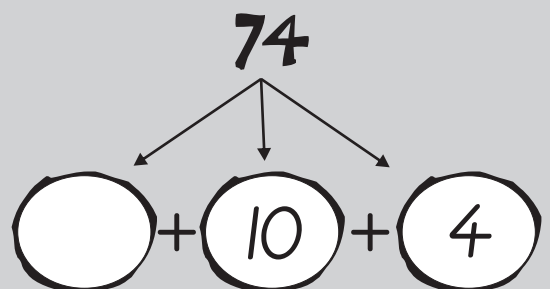
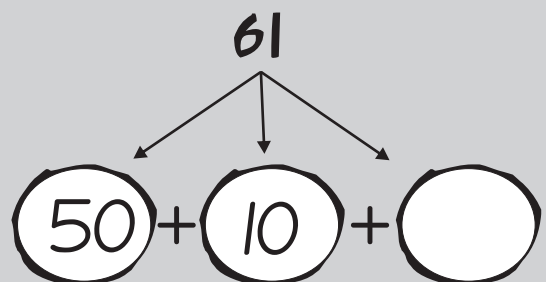
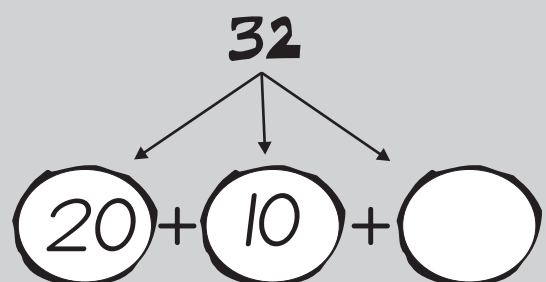
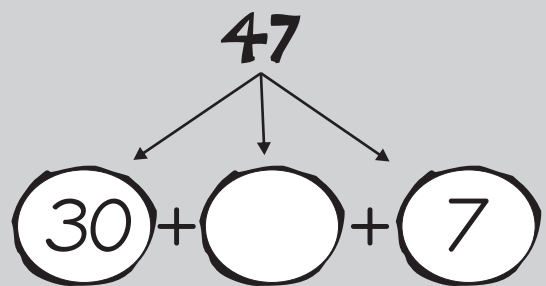
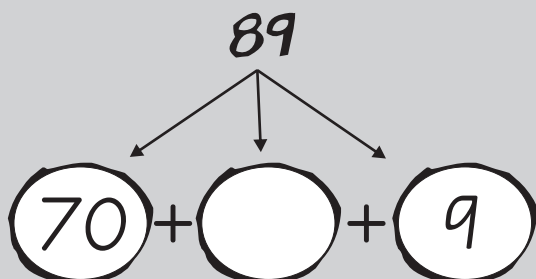
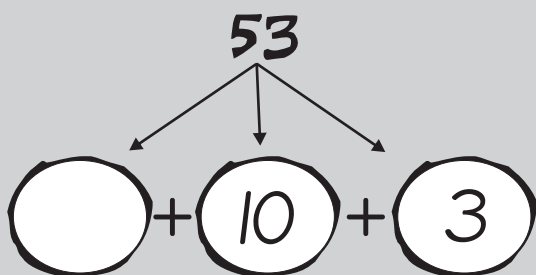
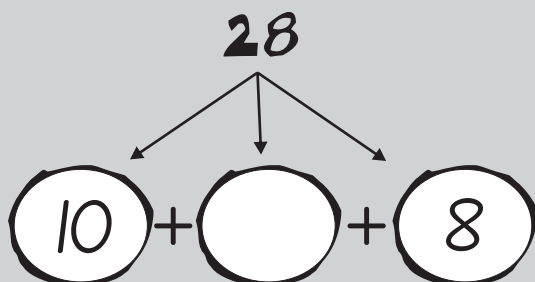
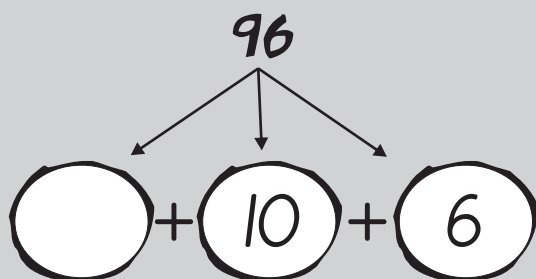
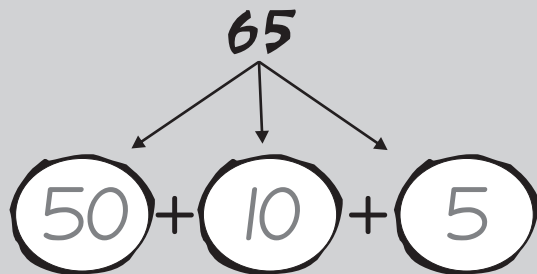


$$\begin{array}{r} 262 \\ - 17 \\ \hline \end{array}$$

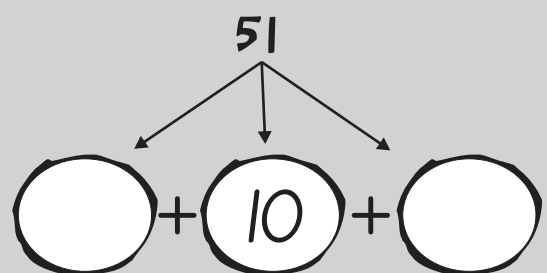
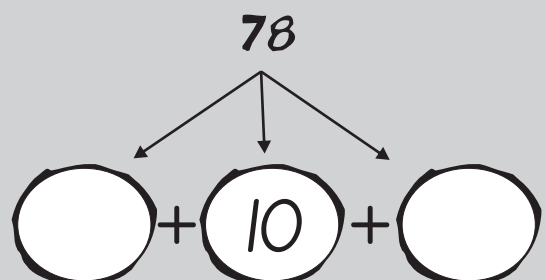
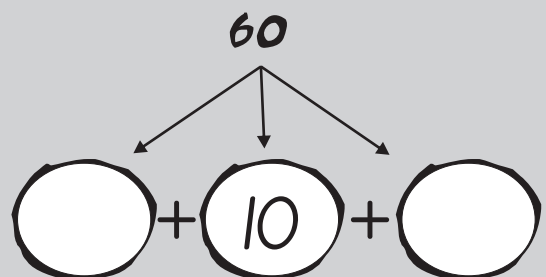
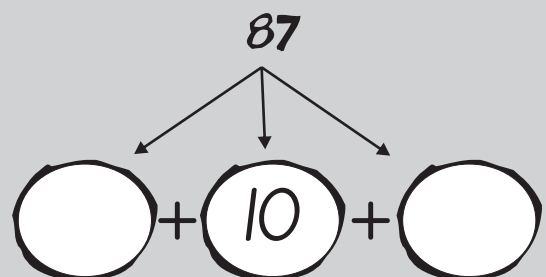
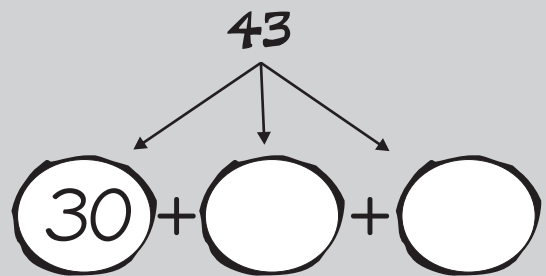
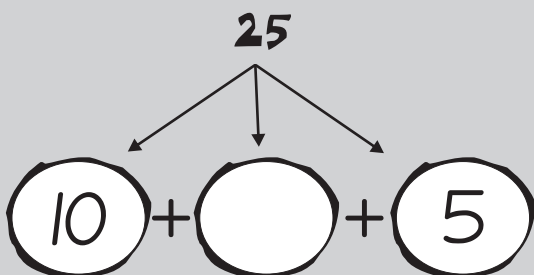
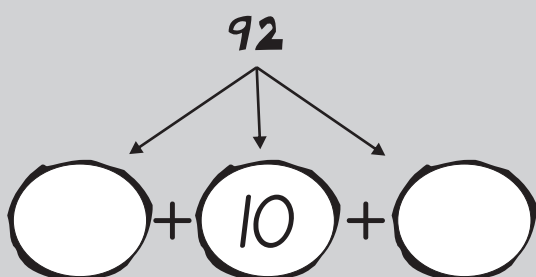
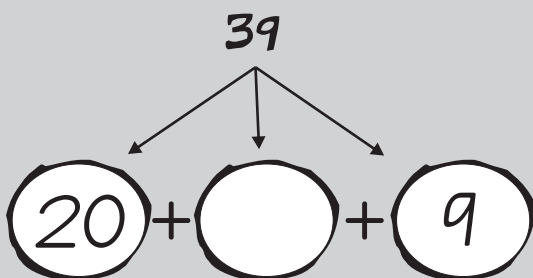
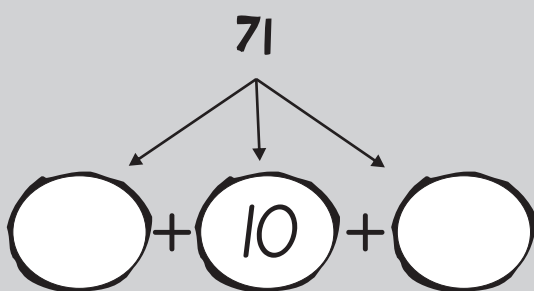
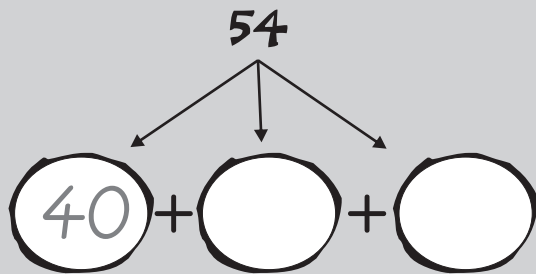


PARTITIONING

Partition these sums.



Partition these sums.



ARITHMETIC STRATEGIES

Complete these sums.

$$59$$

$$\boxed{40} + \boxed{19}$$

$$77$$

$$\boxed{60} + \boxed{}$$

$$23$$

$$\boxed{10} + \boxed{}$$

$$95$$

$$\boxed{} + \boxed{15}$$

$$41$$

$$\boxed{30} + \boxed{}$$

$$81$$

$$\boxed{70} + \boxed{}$$

$$98$$

$$\boxed{} + \boxed{18}$$

$$64$$

$$\boxed{50} + \boxed{}$$

$$32$$

$$\boxed{} + \boxed{12}$$

Partition the numbers to make each subtraction easier.

$$70 - 28$$

$$= \boxed{40+30} - \boxed{28}$$

$$= 40 + 2$$

$$= 42$$

$$80 - 36$$

$$= \boxed{40+40} - \boxed{36}$$

$$= \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

Partition the numbers to make each subtraction easier.

$$\begin{aligned}
 & 50 - 19 \\
 = & \begin{array}{|c|} \hline 30+20 \\ \hline \end{array} - \begin{array}{|c|} \hline 19 \\ \hline \end{array} \\
 = & \underline{30 + 1} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 400 - 55 \\
 = & \begin{array}{|c|} \hline 340+60 \\ \hline \end{array} - \begin{array}{|c|} \hline 55 \\ \hline \end{array} \\
 = & \underline{340 + 5} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 500 - 280 \\
 = & \begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} \\
 = & \underline{\hspace{2cm}} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 600 - 199 \\
 = & \begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} \\
 = & \underline{\hspace{2cm}} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 470 - 58 \\
 = & \begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} \\
 = & \underline{\hspace{2cm}} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 301 - 95 \\
 = & \begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} \\
 = & \underline{\hspace{2cm}} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 847 - 288 \\
 = & \begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} \\
 = & \underline{\hspace{2cm}} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

$$\begin{aligned}
 & 575 - 399 \\
 = & \begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} \\
 = & \underline{\hspace{2cm}} \\
 = & \underline{\hspace{2cm}}
 \end{aligned}$$

METHODS OF SUBTRACTION

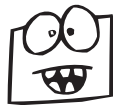
$$\begin{array}{r} 625 \\ - 388 \\ \hline \end{array}$$

$$= \begin{array}{r} 600 + 20 + 5 \\ - 300 + 80 + 8 \\ \hline \end{array}$$



We cannot subtract 8 from 5 but we can rewrite the top line

$$\begin{array}{r} 600 + 10 + 15 \\ - 300 + 80 + 8 \\ \hline \end{array}$$



$$\begin{array}{r} 500 + 110 + 15 \\ - 300 + 80 + 8 \\ \hline \end{array}$$

We cannot subtract 80 from 10 but we can rewrite the top line again

$$\begin{array}{r} 500 + 110 + 15 \\ - 300 + 80 + 8 \\ \hline \end{array}$$

$$200 + 30 + 7 = 237$$



$$\begin{array}{r} 531 \\ - 169 \\ \hline \end{array}$$

Rewrite these equations then do the subtraction.



$$\begin{array}{r} 500 + 30 + 1 \\ - 100 + 60 + 9 \\ \hline \end{array}$$



$$\Rightarrow \begin{array}{r} 500 + 20 + 11 \\ - 100 + 60 + 9 \\ \hline \end{array}$$



$$\Rightarrow \begin{array}{r} + + \\ - + + \\ \hline \end{array}$$

$$\begin{array}{r} 345 \\ 167 \\ \hline \end{array}$$



$$= \underline{\hspace{2cm}}$$



$$\underline{\hspace{2cm}}$$



$$\underline{\hspace{2cm}}$$




$$= \underline{\hspace{2cm}}$$

$$\begin{array}{r} 454 \\ -385 \\ \hline \end{array}$$

Rewrite these equations then do the subtraction.


↳ _____ \Rightarrow _____ \Rightarrow _____

$$\begin{array}{r} 967 \\ -498 \\ \hline \end{array}$$

 = _____

↳ _____ \Rightarrow _____ \Rightarrow _____

$$\begin{array}{r} 721 \\ -155 \\ \hline \end{array}$$


 = _____

↳ _____ \Rightarrow _____ \Rightarrow _____

$$\begin{array}{r} 440 \\ -192 \\ \hline \end{array}$$

 = _____

↳ _____ \Rightarrow _____ \Rightarrow _____

 = _____

PATTERNS

1. Choose a number on the grid and circle it.
2. Cross out all the numbers in the same row and column.
3. Repeat this process until you have chosen 6 numbers.

3

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

28

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

12

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

32

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

19

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

17

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

4. Add up your chosen numbers.

$$3+28+12+32+19+17 = \dots\dots\dots$$

Choose three more sets of 6 numbers and find the sum of each.

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

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

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

SUM =

SUM =

SUM =

SUBTRACTION IN COLUMNS

LEVEL 1

Subtract the digits in each column
- units, tens, hundreds and thousands.

$$\begin{array}{r} 278 \\ -152 \\ \hline 126 \end{array}$$

$8-2=6$
 $70-50=20$
 $200-100=100$

$$\begin{array}{r} 465 \\ -241 \\ \hline \end{array}$$

$$\begin{array}{r} 391 \\ -280 \\ \hline \end{array}$$

$$\begin{array}{r} 874 \\ -123 \\ \hline \end{array}$$

$$\begin{array}{r} 725 \\ -303 \\ \hline \end{array}$$

$$\begin{array}{r} 6852 \\ -2542 \\ \hline \end{array}$$

$$\begin{array}{r} 4395 \\ -1060 \\ \hline \end{array}$$

$$\begin{array}{r} 6997 \\ -6314 \\ \hline \end{array}$$

$$\begin{array}{r} 7368 \\ -6113 \\ \hline \end{array}$$

Answer the questions then crack the code.

$$\begin{array}{r} 896 \\ -790 \\ \hline \end{array}$$

D _____

$$\begin{array}{r} 688 \\ -508 \\ \hline \end{array}$$

A _____

$$\begin{array}{r} 798 \\ -621 \\ \hline \end{array}$$

B _____

$$\begin{array}{r} 412 \\ -211 \\ \hline \end{array}$$

R _____

$$\begin{array}{r} 4579 \\ -4212 \\ \hline \end{array}$$

O _____

$$\begin{array}{r} 6879 \\ -3474 \\ \hline \end{array}$$

E _____

$$\begin{array}{r} 9489 \\ -7065 \\ \hline \end{array}$$

L _____

What never asks questions but gets plenty of answers?

180	106	367	367	201	177	3405	2424	2424	

SUBTRACTION IN COLUMNS

LEVEL 2

Answer the questions then crack the code.

Step 1.

$$\begin{array}{r} 957 \\ -129 \\ \hline \end{array}$$

You cannot subtract 9 from 7
Therefore rearrange 57 to equal 40 + 17

Step 2.

$$\begin{array}{r} 957 \\ -129 \\ \hline 828 \end{array}$$

$$\begin{aligned} 17 - 9 &= 8 \\ 40 - 20 &= 20 \\ 900 - 100 &= 800 \end{aligned}$$

Subtract the following

$$\begin{array}{r} 253 \\ -137 \\ \hline \end{array}$$

$$\begin{array}{r} 635 \\ -306 \\ \hline \end{array}$$

$$\begin{array}{r} 455 \\ -219 \\ \hline \end{array}$$

$$\begin{array}{r} 972 \\ -435 \\ \hline \end{array}$$

$$\begin{array}{r} 544 \\ -128 \\ \hline \end{array}$$

$$\begin{array}{r} 483 \\ -129 \\ \hline \end{array}$$

$$\begin{array}{r} 565 \\ -138 \\ \hline \end{array}$$

$$\begin{array}{r} 823 \\ -509 \\ \hline \end{array}$$

$$\begin{array}{r} 342 \\ -117 \\ \hline \end{array}$$

$$\begin{array}{r} 690 \\ -476 \\ \hline \end{array}$$

$$\begin{array}{r} 2867 \\ -1439 \\ \hline \end{array}$$

$$\begin{array}{r} 3392 \\ -1108 \\ \hline \end{array}$$

$$\begin{array}{r} 4546 \\ -2117 \\ \hline \end{array}$$

$$\begin{array}{r} 1650 \\ -1512 \\ \hline \end{array}$$

$$\begin{array}{r} 651 \\ -313 \\ \hline \end{array}$$

L _____

$$\begin{array}{r} 782 \\ -205 \\ \hline \end{array}$$

G _____

$$\begin{array}{r} 234 \\ -18 \\ \hline \end{array}$$

H _____

$$\begin{array}{r} 746 \\ -539 \\ \hline \end{array}$$

R _____

$$\begin{array}{r} 1985 \\ -1237 \\ \hline \end{array}$$

D _____

$$\begin{array}{r} 5341 \\ -2028 \\ \hline \end{array}$$

C _____

$$\begin{array}{r} 4674 \\ -1519 \\ \hline \end{array}$$

Y _____

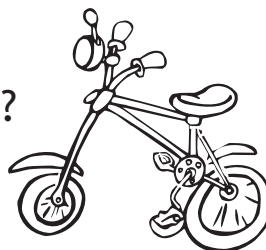
$$\begin{array}{r} 7641 \\ -3205 \\ \hline \end{array}$$

T _____

$$\begin{array}{r} 8672 \\ -1137 \\ \hline \end{array}$$

E _____

What happens to old bicycles?



4436	216	7535	3155

577	7535	4436

207	7535	3313	3155	3313	338	7535	748

SUBTRACTION IN COLUMNS

LEVEL 3

Answer the questions then crack the code.

Step 1.

$$\begin{array}{r} 528 \\ -246 \\ \hline \end{array}$$

↑
2

$$8 - 6 = 2$$

You cannot subtract 40 from 20
Therefore rearrange 528 to equal $400 + 120 + 8$

Step 2.

$$\begin{array}{r} 400 \\ 528 \\ -246 \\ \hline 282 \end{array}$$

$$120 - 40 = 80$$

$$400 - 200 = 200$$

Subtract the following

$$\begin{array}{r} 839 \\ -275 \\ \hline \end{array}$$

$$\begin{array}{r} 843 \\ -180 \\ \hline \end{array}$$

$$\begin{array}{r} 655 \\ -393 \\ \hline \end{array}$$

$$\begin{array}{r} 675 \\ -395 \\ \hline \end{array}$$

$$\begin{array}{r} 817 \\ -251 \\ \hline \end{array}$$

$$\begin{array}{r} 784 \\ -291 \\ \hline \end{array}$$

$$\begin{array}{r} 518 \\ -135 \\ \hline \end{array}$$

$$\begin{array}{r} 809 \\ -453 \\ \hline \end{array}$$

$$\begin{array}{r} 317 \\ -172 \\ \hline \end{array}$$

$$\begin{array}{r} 637 \\ -486 \\ \hline \end{array}$$

$$\begin{array}{r} 5728 \\ -1439 \\ \hline \end{array}$$

$$\begin{array}{r} 2572 \\ -1108 \\ \hline \end{array}$$

$$\begin{array}{r} 4236 \\ -1082 \\ \hline \end{array}$$

$$\begin{array}{r} 3978 \\ -1181 \\ \hline \end{array}$$

$$\begin{array}{r} 323 \\ -150 \\ \hline \end{array}$$

I _____

$$\begin{array}{r} 769 \\ -282 \\ \hline \end{array}$$

N _____

$$\begin{array}{r} 548 \\ -286 \\ \hline \end{array}$$

M _____

$$\begin{array}{r} 465 \\ -274 \\ \hline \end{array}$$

Y _____

$$\begin{array}{r} 2978 \\ -181 \\ \hline \end{array}$$

B _____

$$\begin{array}{r} 4621 \\ -1270 \\ \hline \end{array}$$

H _____

$$\begin{array}{r} 3445 \\ -2070 \\ \hline \end{array}$$

A _____

$$\begin{array}{r} 1620 \\ -1190 \\ \hline \end{array}$$

S _____

$$\begin{array}{r} 5649 \\ -3063 \\ \hline \end{array}$$

L _____

$$\begin{array}{r} 7208 \\ -1134 \\ \hline \end{array}$$

T _____

$$\begin{array}{r} 2928 \\ -1083 \\ \hline \end{array}$$

E _____

Where do teachers come from?

6074	3351	1845



1375	430	430	1845	262	2797	2586	191

2586	173	487	1845

SUBTRACTION IN COLUMNS

LEVEL 4

Answer the questions then crack the code.

Step 1.

$$\begin{array}{r} 824 \\ - 396 \\ \hline \end{array}$$

You cannot subtract 6 from 4.
Therefore rearrange 24 to equal 10 + 14
 $14 - 6 = 8$

Step 2.

$$\begin{array}{r} 8\overset{1}{2}4 \\ - 396 \\ \hline 8 \end{array}$$

You cannot subtract 90 from 10.
Therefore rearrange to equal 700 + 110 + 14

$$\begin{array}{l} 700 - 300 = 400 \\ 110 - 90 = 20 \end{array}$$

Step 3.

$$\begin{array}{r} 7\overset{1}{0}0\overset{1}{1}4 \\ - 396 \\ \hline 428 \end{array}$$

Subtract the following

$$\begin{array}{r} 655 \\ - 198 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 645 \\ - 368 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 943 \\ - 299 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 333 \\ - 185 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 525 \\ - 236 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 6842 \\ - 2476 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 4243 \\ - 1047 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 3911 \\ - 2545 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 6716 \\ - 5089 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 258 \\ -159 \\ \hline \end{array}$$

U _____

$$\begin{array}{r} 856 \\ -278 \\ \hline \end{array}$$

B _____

$$\begin{array}{r} 523 \\ -156 \\ \hline \end{array}$$

V _____

$$\begin{array}{r} 611 \\ -463 \\ \hline \end{array}$$

N _____

$$\begin{array}{r} 467 \\ -269 \\ \hline \end{array}$$

D _____

$$\begin{array}{r} 732 \\ -447 \\ \hline \end{array}$$

F _____

$$\begin{array}{r} 514 \\ -435 \\ \hline \end{array}$$

L _____

$$\begin{array}{r} 852 \\ -399 \\ \hline \end{array}$$

S _____

$$\begin{array}{r} 4567 \\ -3063 \\ \hline \end{array}$$

O _____

$$\begin{array}{r} 6724 \\ -2388 \\ \hline \end{array}$$

R _____

$$\begin{array}{r} 1211 \\ -79 \\ \hline \end{array}$$

T _____

$$\begin{array}{r} 3481 \\ -382 \\ \hline \end{array}$$

E _____

Some helpful advice ...

198	1504	148	1132

3099	367	3099	4336

578	3099

1132	1504	1504

285	99	79	79

285	1504	4336

198	3099	453	453	3099	4336	1132

SUBTRACTION IN COLUMNS

LEVEL 5

Answer the questions then crack the code.

$$\begin{array}{r} 8344 \\ -5555 \\ \hline \end{array}$$

D _____

$$\begin{array}{r} 5388 \\ -3799 \\ \hline \end{array}$$

G _____

$$\begin{array}{r} 4382 \\ -1495 \\ \hline \end{array}$$

N _____

$$\begin{array}{r} 6112 \\ -2284 \\ \hline \end{array}$$

S _____

$$\begin{array}{r} 8153 \\ -4785 \\ \hline \end{array}$$

V _____

$$\begin{array}{r} 7000 \\ -1567 \\ \hline \end{array}$$

F _____

$$\begin{array}{r} 6000 \\ -2593 \\ \hline \end{array}$$

W _____

$$\begin{array}{r} 5500 \\ -2961 \\ \hline \end{array}$$

C _____

$$\begin{array}{r} 8678 \\ -1989 \\ \hline \end{array}$$

Y _____

$$\begin{array}{r} 2479 \\ -999 \\ \hline \end{array}$$

H _____

$$\begin{array}{r} 1263 \\ -585 \\ \hline \end{array}$$

E _____

$$\begin{array}{r} 7172 \\ -1997 \\ \hline \end{array}$$

R _____

$$\begin{array}{r} 4867 \\ -2788 \\ \hline \end{array}$$

T _____

$$\begin{array}{r} 9352 \\ -2769 \\ \hline \end{array}$$

U _____

$$\begin{array}{r} 3821 \\ -1888 \\ \hline \end{array}$$

A _____

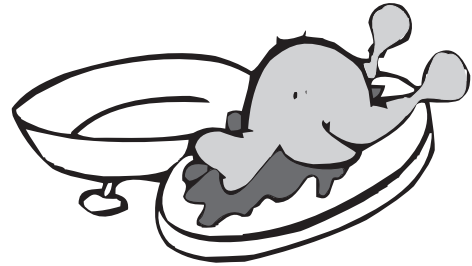
$$\begin{array}{r} 2051 \\ -177 \\ \hline \end{array}$$

O _____



Some helpful advice ...

2887	678	3368	678	5175

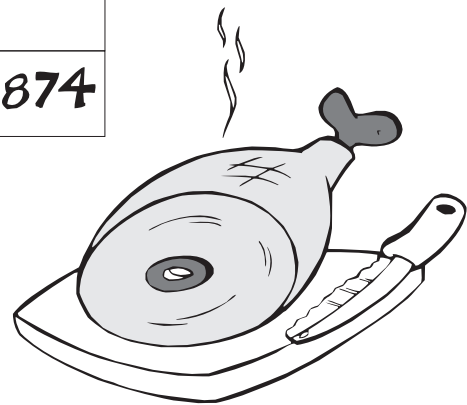


2079	5175	6583	3828	2079

1933

2789	1874	1589

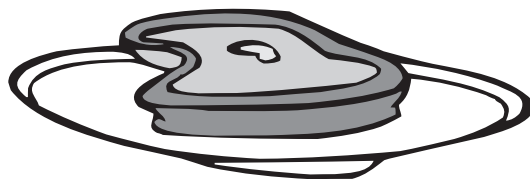
2079	1874



3407	1933	2079	2539	1480

6689	1874	6583	5175

5433	1874	1874	2789



ARITHMETIC GALORE

Fill in the boxes to complete the sums.

$$\begin{array}{r} 2000 \\ + \square\square\square\square \\ \hline 4600 \end{array}$$

$$\begin{array}{r} 2865 \\ + \square\square\square\square \\ \hline 7000 \end{array}$$

$$\begin{array}{r} 32\square \\ + 648 \\ \hline 973 \end{array}$$

$$\begin{array}{r} 38\square\square \\ + 1132 \\ \hline 5000 \end{array}$$

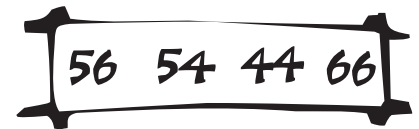
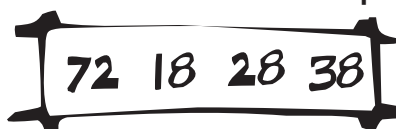
$$\begin{array}{r} 3500 \\ - \square\square\square\square \\ \hline 2028 \end{array}$$

$$\begin{array}{r} 3960 \\ - \square\square\square\square \\ \hline 1245 \end{array}$$

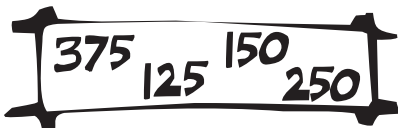
$$\begin{array}{r} 3\square\square9 \\ - 1471 \\ \hline 2008 \end{array}$$

$$\begin{array}{r} 4000 \\ - 2\square\square5 \\ \hline 1135 \end{array}$$

Circle two numbers in each box that add up to 100.



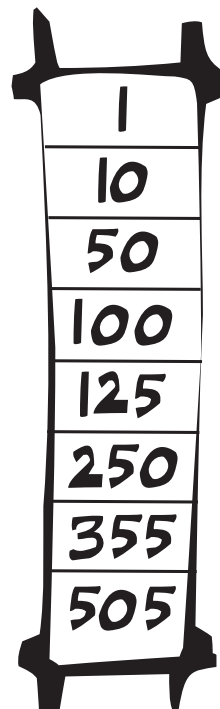
Circle two numbers in each box that add up to 500.



Subtract each number from 1000.



-



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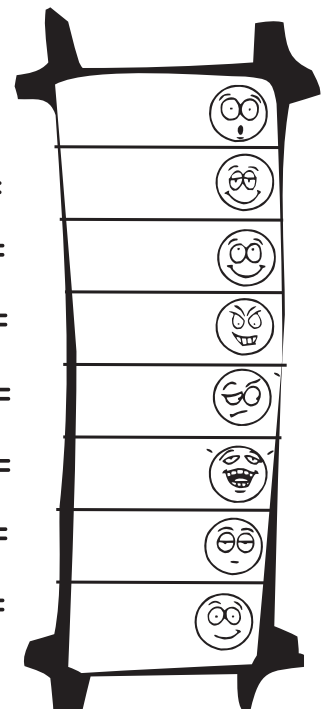
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Complete the 3 digit subtraction below.

$$\begin{array}{r} \square\square5 \\ - 20\square \\ \hline 783 \end{array}$$

PEASANT MULTIPLICATION

The following is called the Russian Peasant Method of Multiplication.

e.g. 39×65

STEP 1

Put the numbers in two columns.
Double each consecutive number in column 1. Halve each consecutive number in Column 2. (Omit remainders.)

STEP 1

Column 1	Column 2
39	65
78	32
156	16
312	8
624	4
1248	2
2496	1

STEP 2

Add all the numbers in column 1 which are opposite odd numbers in column 2.

STEP 2

$$\begin{array}{r}
 39 \\
 + 2496 \\
 \hline
 2535
 \end{array}$$

THE ANSWER

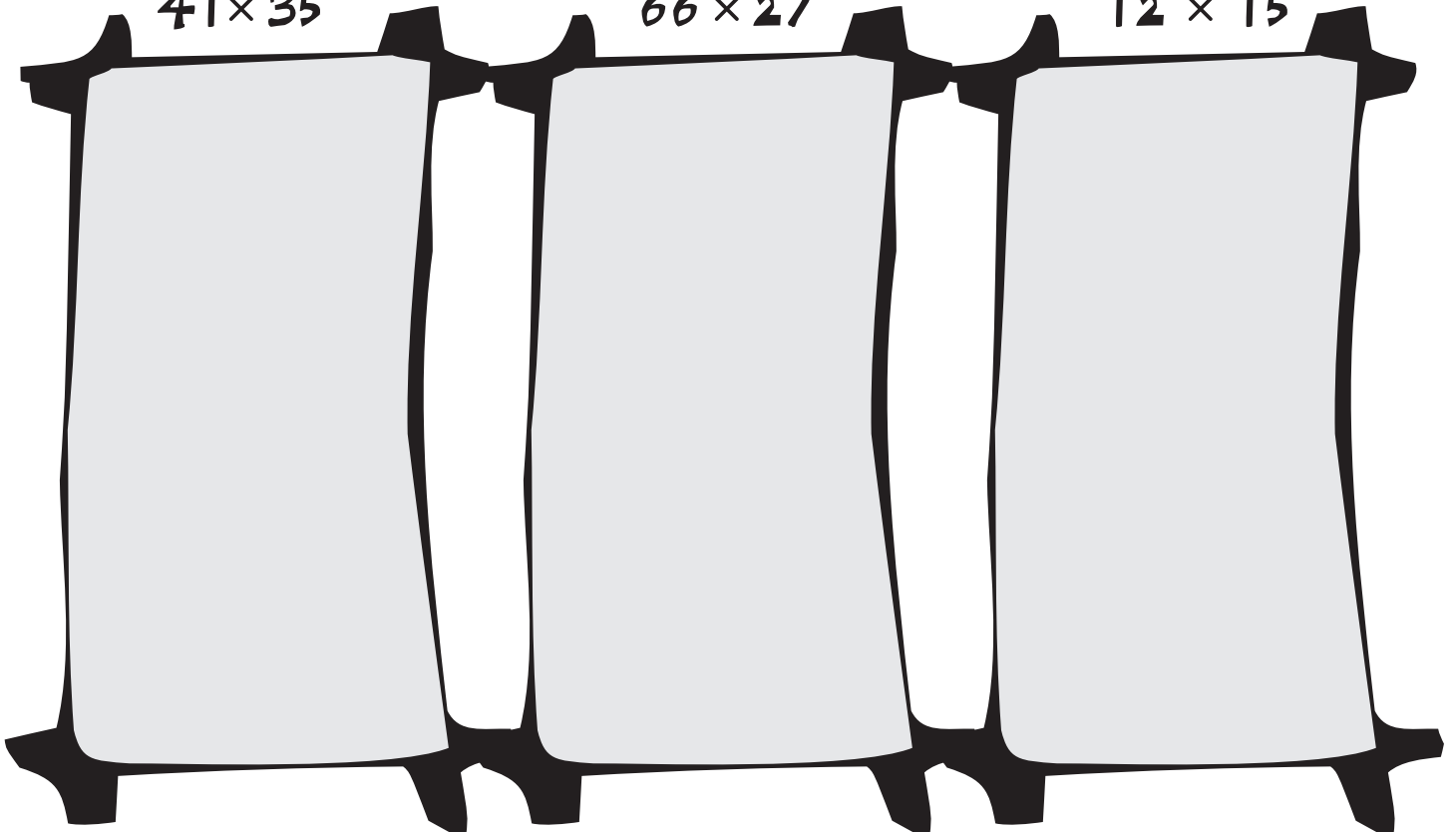
$$39 \times 65 = 2535$$

Use the Russian Peasant Method of Multiplication to multiply:

41×35

66×27

12×15




ARITHMETIC IN WORDS

The sum of two numbers is 3000.

If the smaller number is 1250, what is the larger number?

$$\begin{array}{l} \boxed{3000} \\ \boxed{1250} + \boxed{x} \end{array}$$

ANSWER



$$\begin{array}{r} 3000 \\ - 1250 \\ \hline 1750 \end{array}$$

The sum of two numbers is 5500.

If the larger number is 3950, what is the smaller number?

$$\begin{array}{l} \boxed{5500} \\ \boxed{3950} + \boxed{x} \end{array}$$

ANSWER



$$\begin{array}{r} 5500 \\ - \quad \quad \\ \hline \quad \quad \end{array}$$

A number, x , has 2500 added to it to make 6000

What is the number?

$$\begin{array}{l} \boxed{x} + \boxed{2500} \\ \boxed{6000} \end{array}$$

ANSWER



The difference between 550 and an unknown number is 250.


What could the unknown number be?

$$\begin{array}{l} \boxed{x} + \boxed{250} \\ \boxed{550} \end{array}$$

or

$$\begin{array}{l} \boxed{x} \\ \boxed{550} + \boxed{250} \end{array}$$

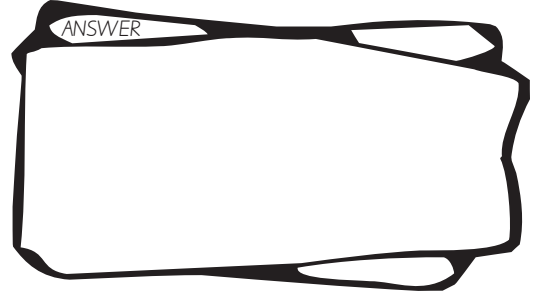
ANSWER



Fastbake bakers can produce 125 loaves of bread each hour.
How many can they produce in 8 hours?

1 hour  125 loaves

8 hours 



Fastbake bakers purchase new ovens.
Oven A produces 125 loaves of bread each hour.
Oven B produces twice as many loaves as Oven A in 1 hour.
Oven C produces three times as many loaves as Oven A in 1 hour.

How many loaves can the three machines produce in 4 hours?

Oven A  = _____

Oven B  = _____

Oven C  = _____



_____ Total (1 hr)

_____ Total (4 hrs)



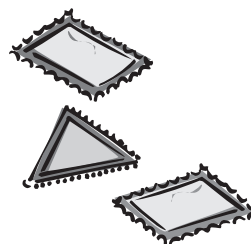
Helen has 324 stamps. She has 3 times as many stamps as Michael.
Peter has 3 times as many stamps as Helen.
Calculate the total number of stamps from all three children.

Helen _____

Michael _____

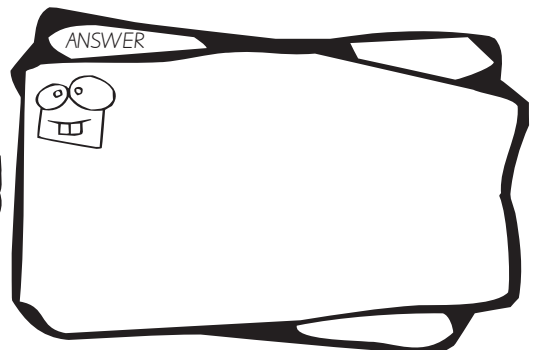
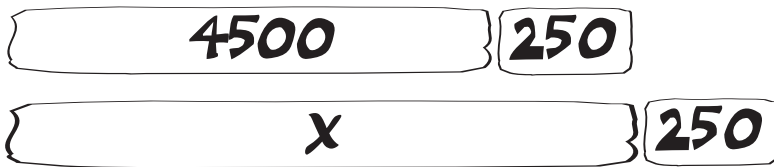
Peter _____

Total _____

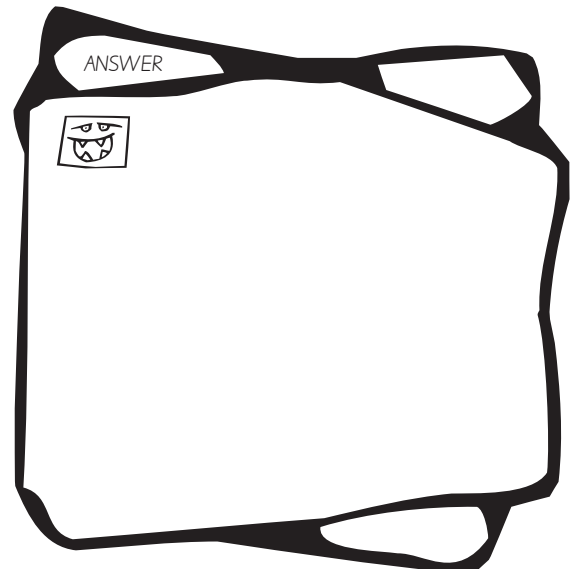
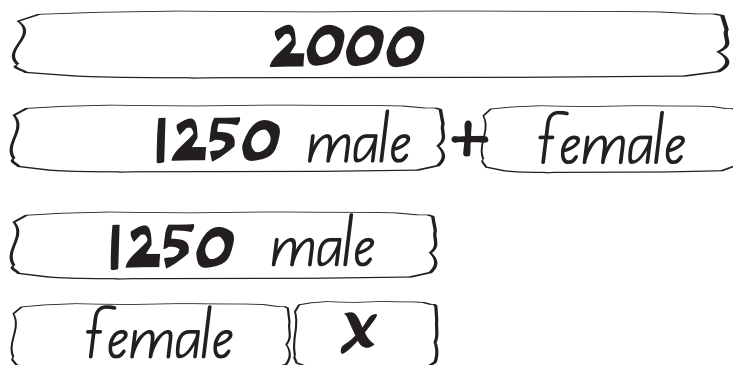


ARITHMETIC IN WORDS

250 more than 4500 is the same as 250 less than ...?

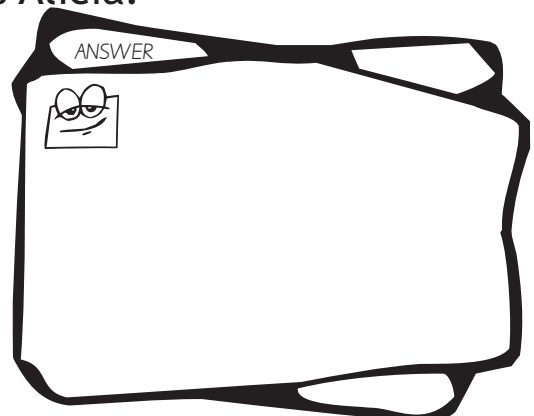


There are 2000 office workers in a building.
1250 of the office workers are male and the rest are female.
How many more male than female are there?



Royce has 30 cards.
Alicia has twice as many cards as Royce.
Mandy has three times as many cards as Alicia.

How many cards does Alicia have?
How many cards does Mandy have?

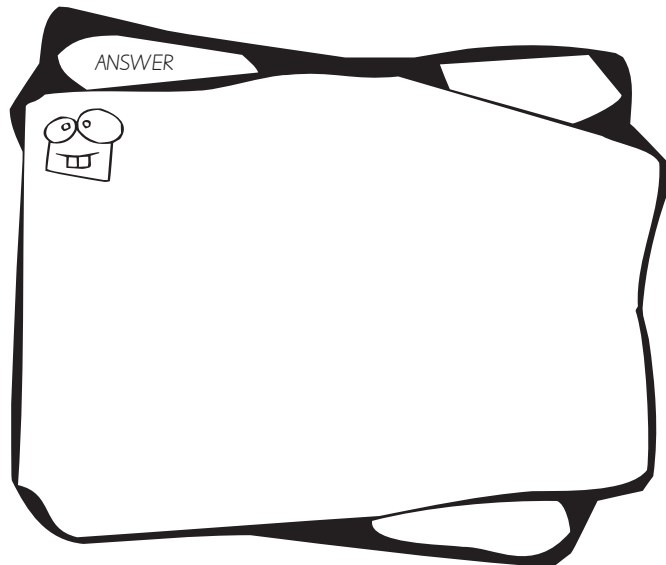


The difference between two numbers is 150. If the sum of the two numbers is 500, what are the values of each number?

Smaller number: x

Larger number: $x + 150$

$$x + x + 150 = 500$$



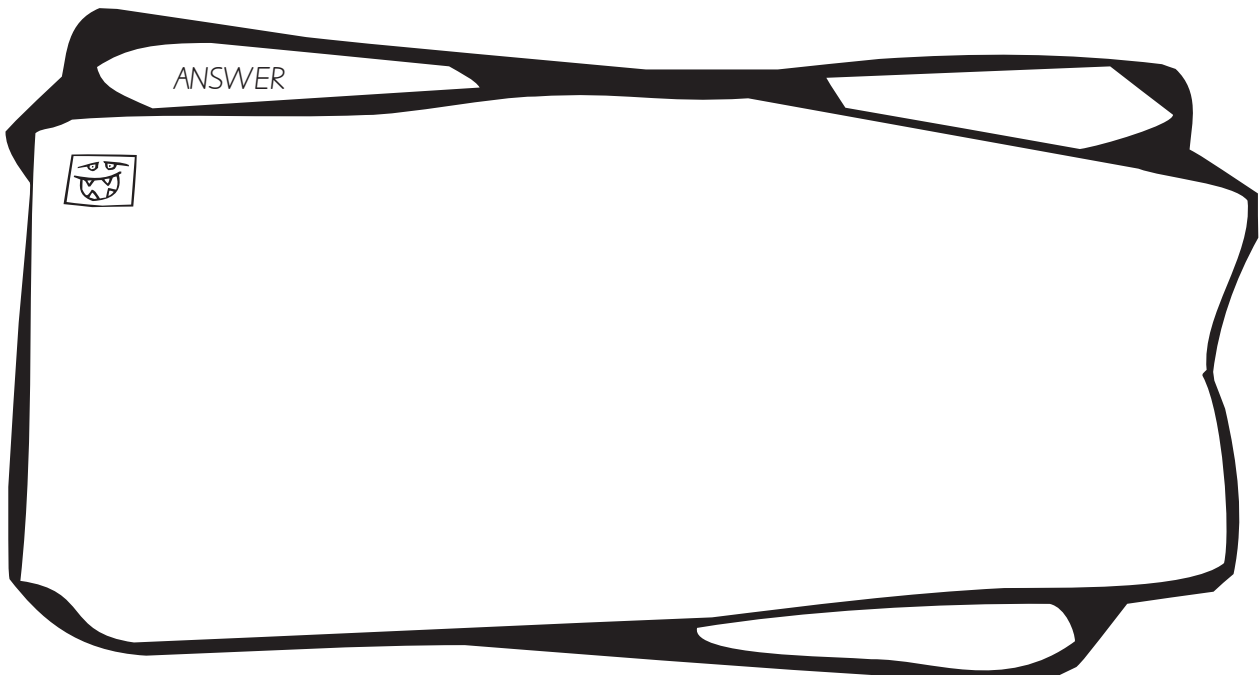
Daniel and Daisy put all their savings together to purchase a car. In total they have \$2500 however Daniel has \$260 more than Daisy. Their mother, Helen, contributes twice as much as Daniel. How much money does each contribute and how much is there in total?

Daisy x

$$x + x + 260 = 2500$$

Daniel $x + 260$

Helen $\quad + \quad$



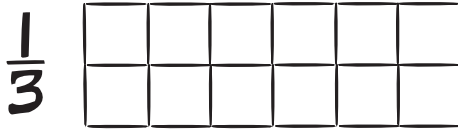
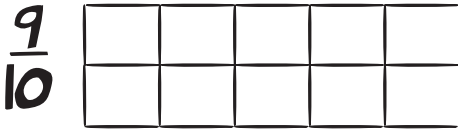
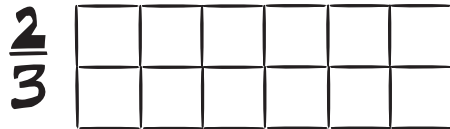
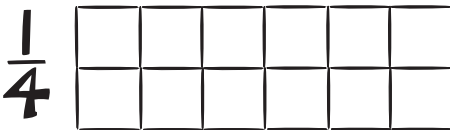
BASIC FRACTIONS

Can you recognise the main fractions? Write these fractions.

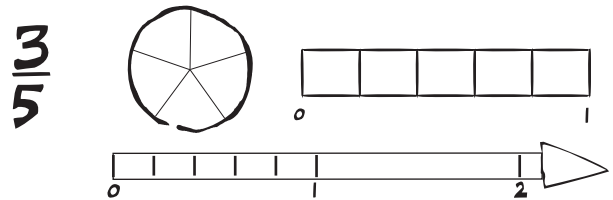
One half Three quarters Two fifths

Five eighths Seven tenths One sixth

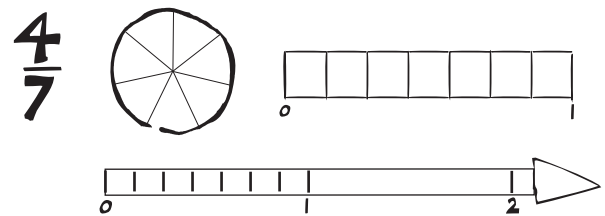
Colour the boxes to indicate each fraction.



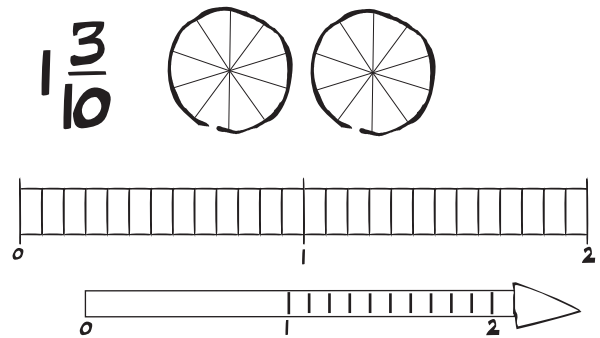
Show the fraction in different ways.



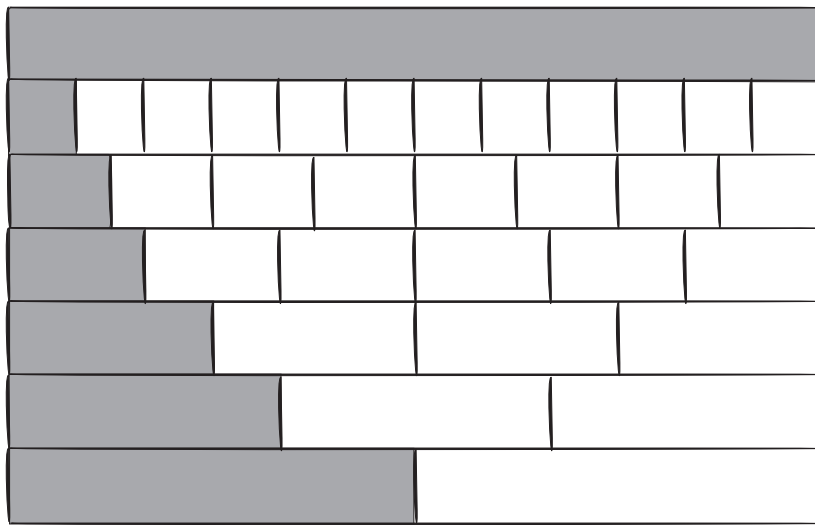
Show the fraction in different ways.



Show the fraction in different ways.



The strip shown is 1 unit long. What is the value of each shaded part?

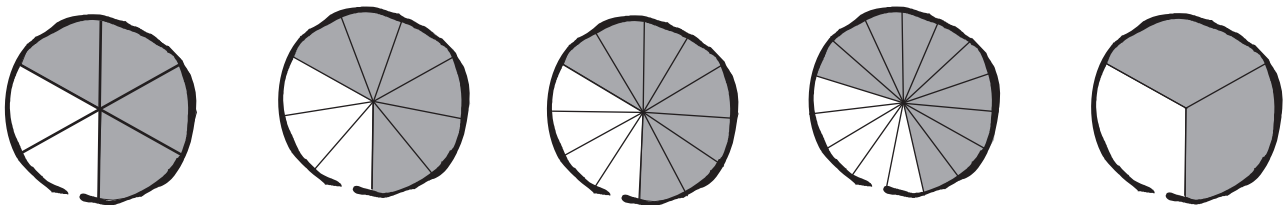


1 unit

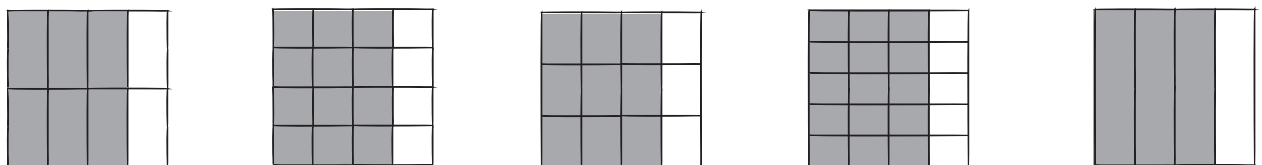
Each row below shows equivalent fractions. Write down the fraction and the simplest fraction they are equivalent to.



.....



.....



.....

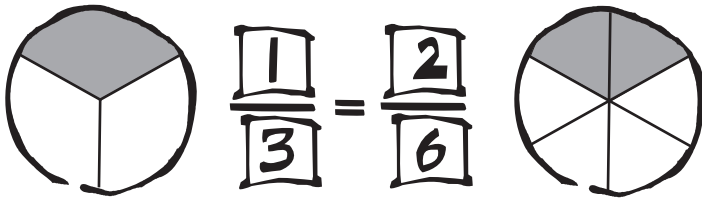
EQUIVALENT FRACTIONS

Equivalent fractions have the same value.

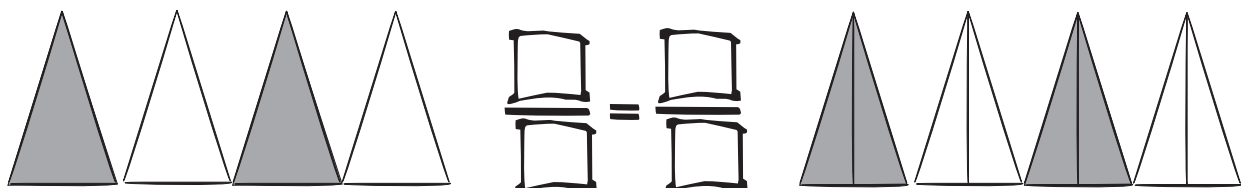
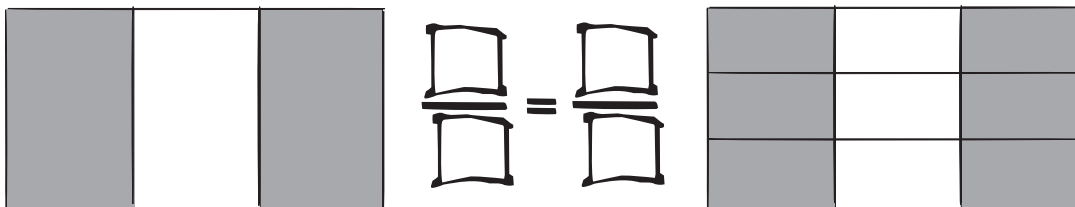
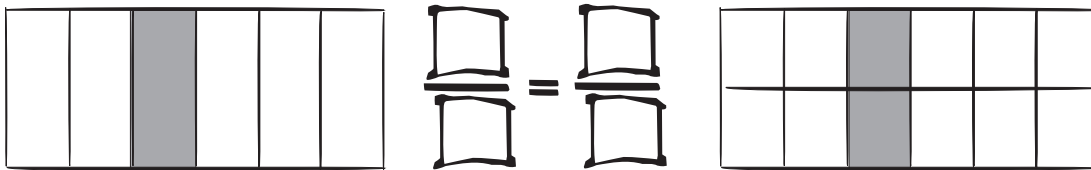
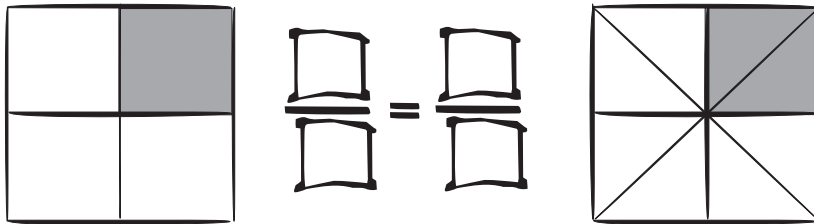
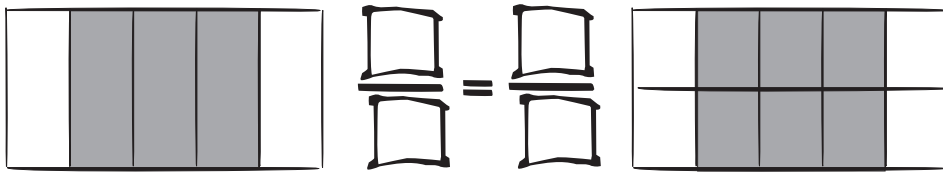
Show what fraction of each figure is shaded.

$$\frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

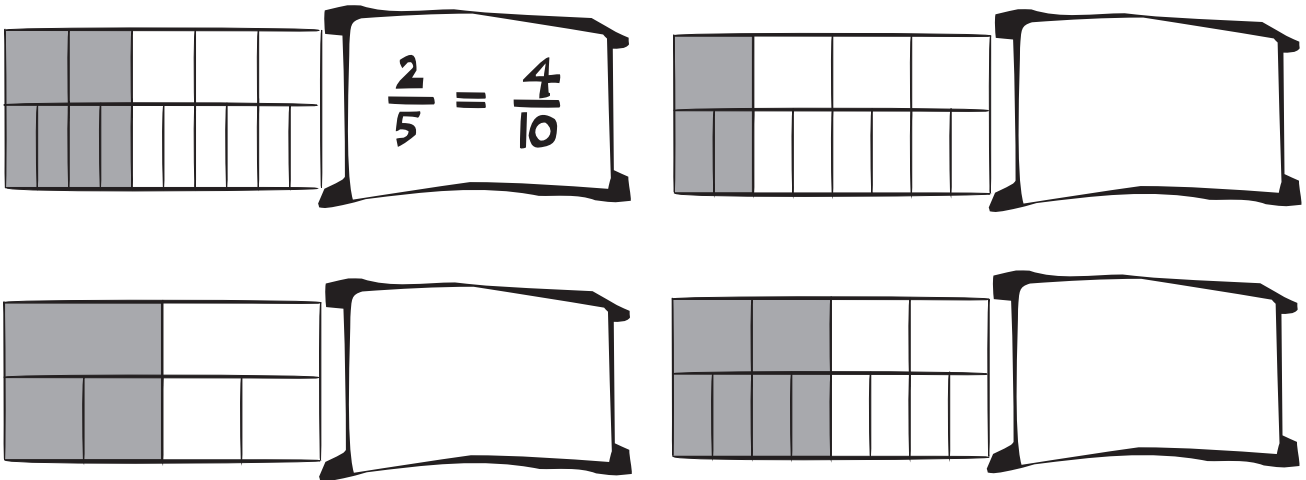
$$\frac{2}{2} = 1$$



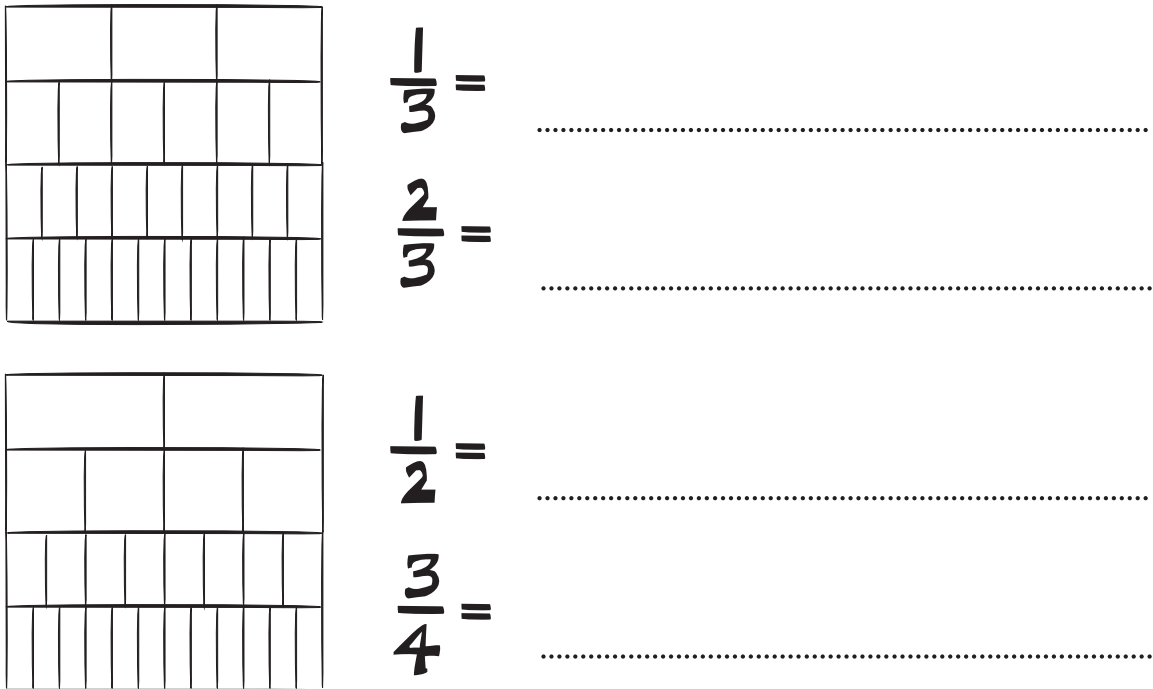
You can multiply a fraction's numerator and denominator by the same number to get an equivalent fraction. You are really only multiplying by 1.



Write each of the equivalent fractions shown.



Write down equivalent fractions to the ones shown.



Complete each of the equivalent fractions.

$\frac{1}{2} = \frac{\quad}{10}$
 $\frac{1}{3} = \frac{3}{6}$
 $\frac{1}{2} = \frac{\quad}{16}$
 $\frac{2}{5} = \frac{\quad}{10}$
 $\frac{5}{6} = \frac{\quad}{12}$

$\frac{24}{36} = \frac{12}{\quad} = \frac{\quad}{9} = \frac{\quad}{3}$
 $\frac{18}{24} = \frac{\quad}{12} = \frac{3}{\quad}$

MORE FRACTIONS

Arrange $\frac{3}{4}$ $\frac{2}{3}$ $\frac{5}{6}$ and $\frac{1}{2}$ in ascending order.

Hint: change each of the fractions into equivalent fractions with a denominator of 12 then put them in ascending order (smallest to largest).

$$\frac{3}{4} = \frac{\quad}{12} \quad \frac{2}{3} = \frac{\quad}{12} \quad \frac{5}{6} = \frac{\quad}{12} \quad \frac{1}{2} = \frac{\quad}{12}$$

.....

Put each group of fractions into ascending order. The number in the circle is a suggested denominator for equivalent fractions.

(12) $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{6}$ _____

(9) $\frac{16}{18}$ $\frac{2}{3}$ $\frac{5}{9}$ $\frac{1}{3}$ _____

(8) $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{8}$ _____

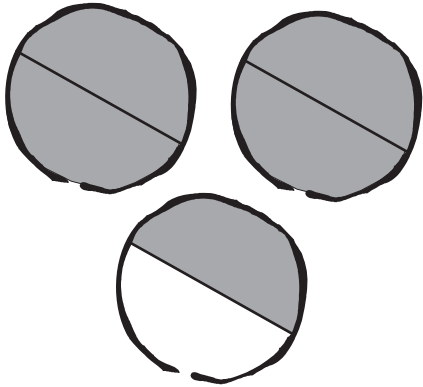
(12) $\frac{5}{6}$ $\frac{1}{2}$ $\frac{2}{3}$ $\frac{7}{12}$ _____

(24) $\frac{3}{8}$ $\frac{1}{2}$ $\frac{7}{12}$ $\frac{5}{6}$ _____

(8) 1 $\frac{12}{16}$ $\frac{1}{4}$ $\frac{3}{8}$ _____

FRACTIONS GREATER THAN ONE

Complete each sentence.

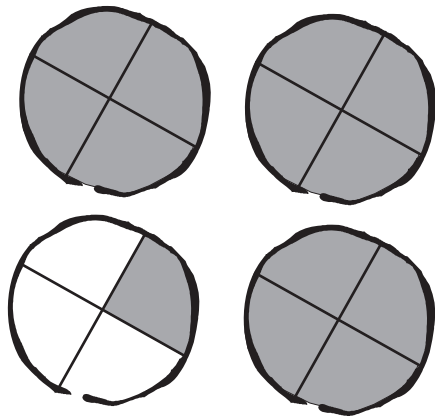


Each circle is divided into parts.

There are shaded halves.

This can be written $\frac{5}{2}$

Writing this as a mixed number = $2\frac{1}{2}$

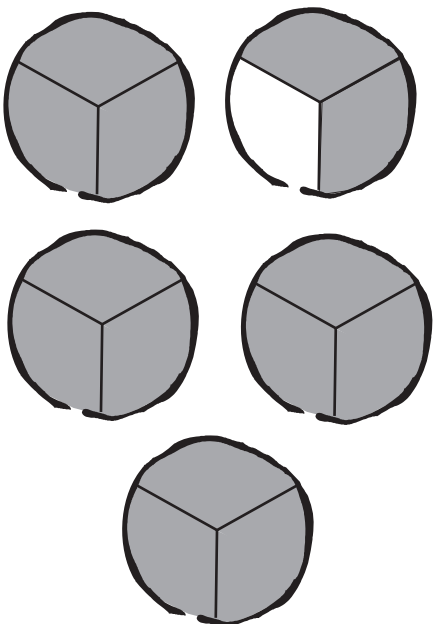


Each circle is divided into parts.

There are shaded fourths.

This can be written

Writing this as a mixed number =



Each circle is divided into parts.

There are shaded thirds.

This can be written

Writing this as a mixed number =

FRACTIONS GREATER THAN ONE

Write these numbers as mixed numbers then show each of them on the number line.

$$\frac{3}{2} =$$

$$\frac{5}{2} =$$

$$\frac{2}{2} =$$



$$\frac{5}{3} =$$

$$\frac{8}{3} =$$

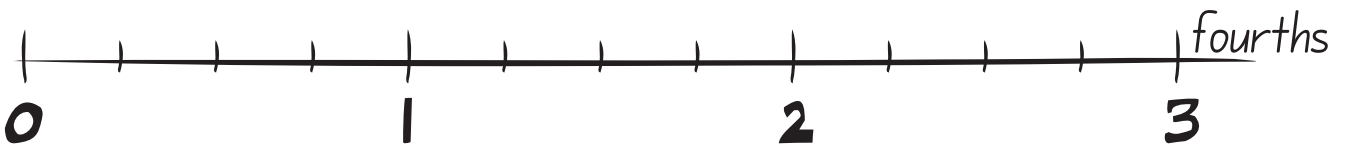
$$\frac{9}{3} =$$



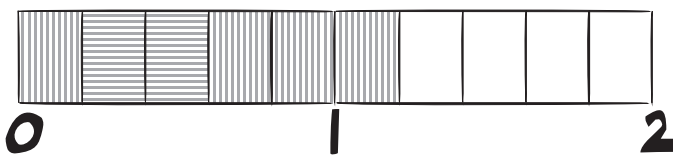
$$\frac{5}{4} =$$

$$\frac{7}{4} =$$

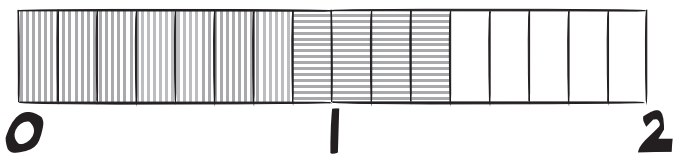
$$\frac{11}{4} =$$



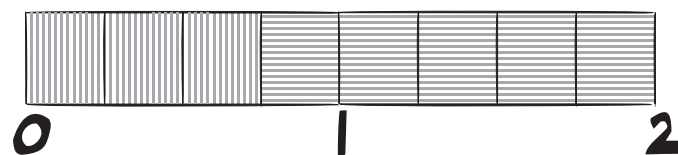
Add these fractions. The number strips might help.



$$\frac{1}{5} + \frac{2}{5} + \frac{3}{5} =$$



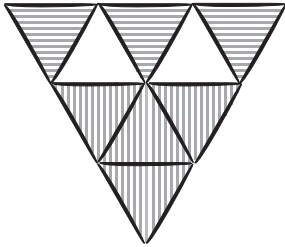
$$\frac{7}{8} + \frac{4}{8} =$$



$$\frac{3}{4} + \frac{5}{4} =$$

FRACTION ARITHMETIC

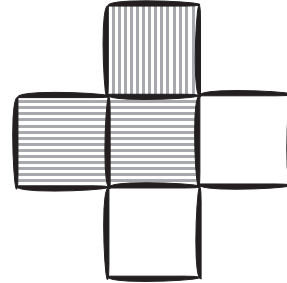
Complete each sum.



$$\frac{3}{9} + \frac{2}{9} =$$

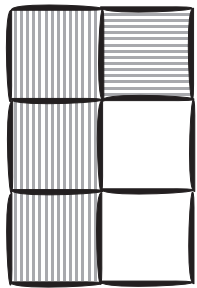
$$\frac{4}{9} + \frac{3}{9} =$$

$$\frac{2}{9} + \frac{4}{9} =$$



$$\frac{2}{5} + \frac{2}{5} =$$

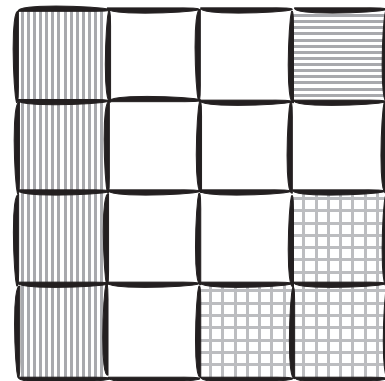
$$\frac{2}{5} + \frac{1}{5} =$$



$$\frac{3}{6} + \frac{2}{6} =$$

$$\frac{2}{6} + \frac{1}{6} =$$

$$\frac{1}{6} + \frac{2}{6} =$$

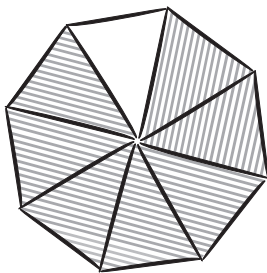


$$\frac{3}{16} + \frac{4}{16} =$$

$$\frac{4}{16} + \frac{1}{16} =$$

$$\frac{1}{16} + \frac{8}{16} =$$

$$\frac{8}{16} + \frac{3}{16} =$$



$$\frac{5}{8} + \frac{2}{8} =$$

$$\frac{2}{8} + \frac{1}{8} =$$

$$\frac{1}{8} + \frac{5}{8} =$$

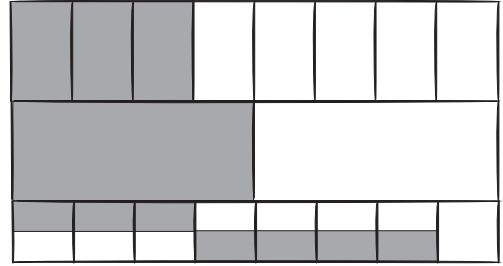
ADDING FRACTIONS

Add the fractions on these two pages.

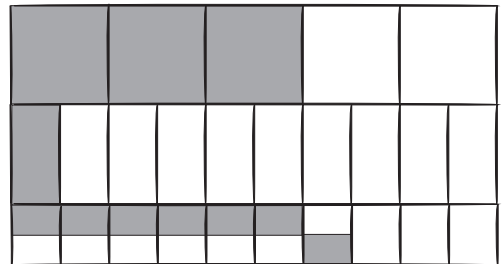
Before adding make sure each fraction has the same denominator.

$$\frac{3}{8} + \frac{1}{2} = \frac{3}{8} + \frac{4}{8}$$

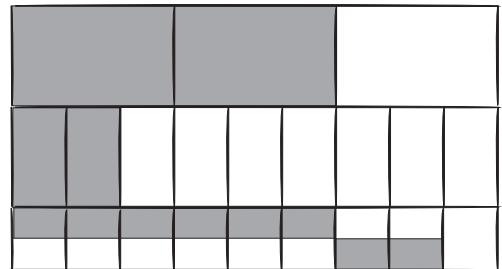
$$=$$



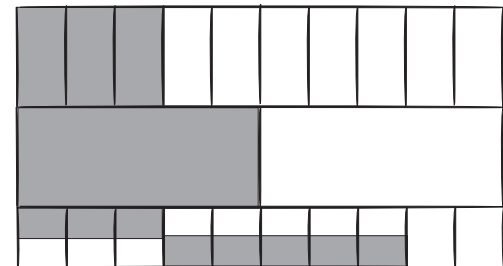
$$\frac{3}{5} + \frac{1}{10} =$$



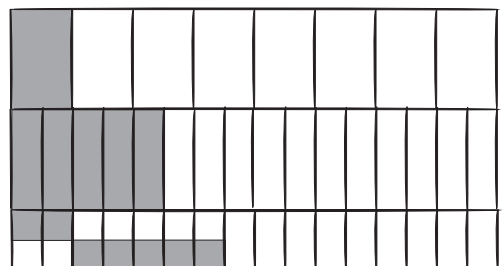
$$\frac{2}{3} + \frac{2}{9} =$$



$$\frac{3}{10} + \frac{1}{2} =$$



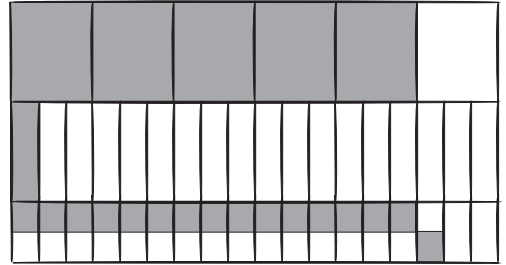
$$\frac{1}{8} + \frac{5}{16} =$$



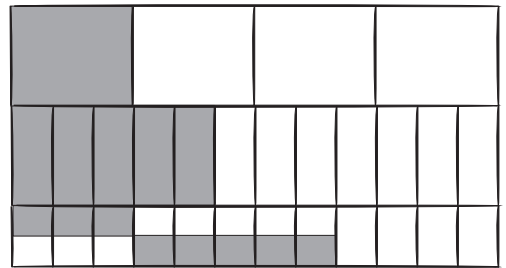
$$\frac{1}{3} + \frac{8}{21} =$$



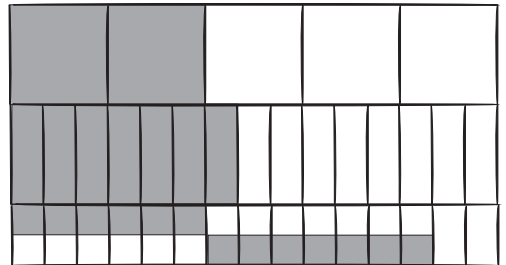
$$\frac{5}{6} + \frac{1}{18} =$$



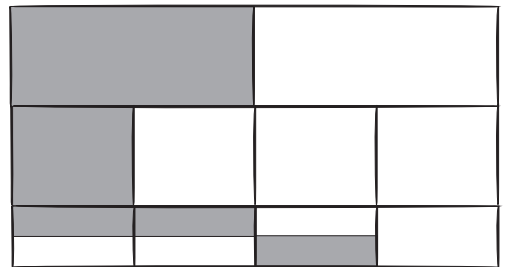
$$\frac{1}{4} + \frac{5}{12} =$$



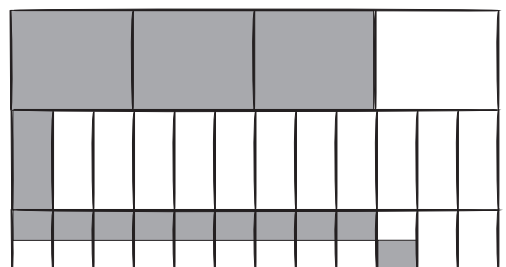
$$\frac{2}{5} + \frac{7}{15} =$$



$$\frac{1}{2} + \frac{1}{4} =$$



$$\frac{3}{4} + \frac{1}{12} =$$



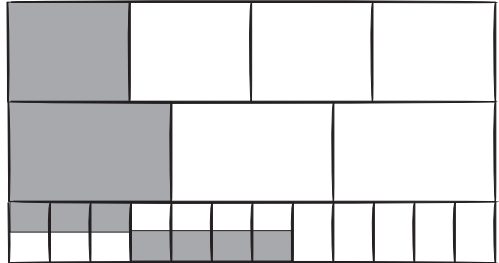
ADDING FRACTIONS

Add the fractions on this page.

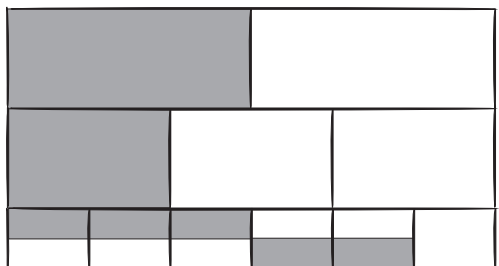
Before adding make sure each fraction has the same denominator.

$$\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12}$$

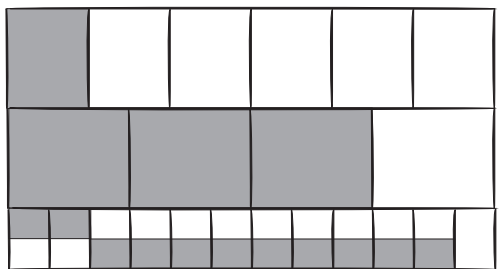
$$=$$



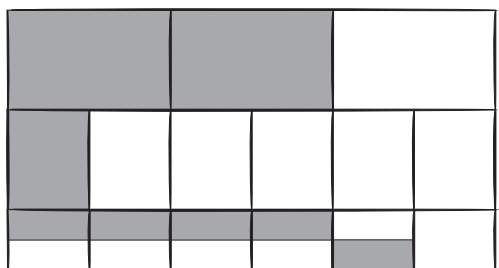
$$\frac{1}{2} + \frac{1}{3} =$$



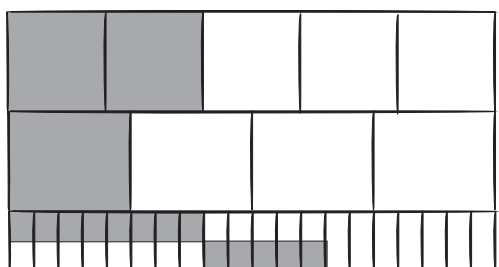
$$\frac{1}{6} + \frac{3}{4} =$$



$$\frac{2}{3} + \frac{1}{6} =$$

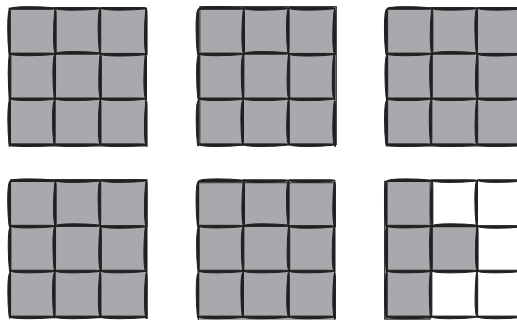
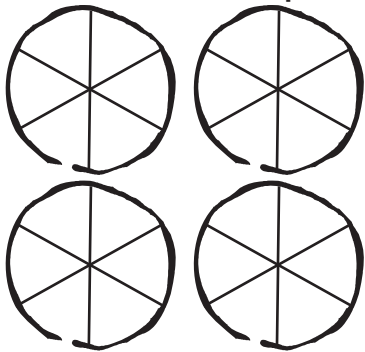


$$\frac{2}{5} + \frac{1}{4} =$$



FINAL FRACTIONS

Answer all the questions.



Shade $2\frac{1}{3}$

How much is shaded? _____

Rename these fractions as a mixed or whole numbers.

$$\frac{15}{4} = \underline{\hspace{2cm}} \quad \frac{9}{2} = \underline{\hspace{2cm}} \quad \frac{12}{3} = \underline{\hspace{2cm}} \quad \frac{10}{9} = \underline{\hspace{2cm}}$$

Rewrite these mixed numbers as fractions.

$$4\frac{2}{3} = \underline{\hspace{2cm}} \quad 5\frac{3}{4} = \underline{\hspace{2cm}} \quad 2\frac{6}{6} = \underline{\hspace{2cm}} \quad 1\frac{3}{2} = \underline{\hspace{2cm}}$$

Add these fractions. Simplify if necessary.

$3\frac{1}{5}$	$5\frac{2}{3}$	$2\frac{1}{8}$	$3\frac{5}{9}$
$+ 2\frac{3}{5}$	$+ 2\frac{1}{3}$	$+ 1\frac{3}{8}$	$+ 2\frac{1}{9}$
<hr style="width: 80%; margin: 0 auto;"/>	<hr style="width: 80%; margin: 0 auto;"/>	<hr style="width: 80%; margin: 0 auto;"/>	<hr style="width: 80%; margin: 0 auto;"/>
<hr style="width: 80%; margin: 0 auto;"/>	<hr style="width: 80%; margin: 0 auto;"/>	<hr style="width: 80%; margin: 0 auto;"/>	<hr style="width: 80%; margin: 0 auto;"/>

Add these fractions.

$\frac{1}{2} + \frac{1}{4} = \underline{\hspace{2cm}}$	$\frac{2}{3} + \frac{2}{6} = \underline{\hspace{2cm}}$	$\frac{3}{5} + \frac{4}{10} = \underline{\hspace{2cm}}$
$\frac{2}{4} + \frac{4}{8} = \underline{\hspace{2cm}}$	$\frac{7}{6} + \frac{2}{3} = \underline{\hspace{2cm}}$	$\frac{4}{8} + \frac{3}{12} = \underline{\hspace{2cm}}$

UNDERSTANDING \times AND \div

Complete each of the following:

$$25 + 25 + 25 + 25 + 25 + 25 = \underline{\quad} \times 25$$
$$= \underline{\quad}$$

$$36 + \underline{\quad} = 4 \times 36$$
$$= \underline{\quad}$$

$$18 + 18 + 18 + 18 + 18 + 18 + 18 + 18 = \underline{\quad} \times 18$$
$$= \underline{\quad}$$

$$120 - 20 - 20 - 20 - 20 - 20 - 20 - 20 = 0$$
$$\therefore 120 \div 20 = \underline{\quad}$$

$$56 - \underline{8} = 0$$
$$\therefore 56 \div \underline{\quad} = 7$$

$$65 - \underline{13} = 0$$
$$\therefore 65 \div \underline{\quad} = 5$$

Show that the product is the same regardless of the order.

$$5 \times 2 \times 15 = \underline{\quad}$$

$$7 \times 3 \times 10 = \underline{\quad}$$

$$2 \times 5 \times 15 = \underline{\quad}$$

$$10 \times 3 \times 7 = \underline{\quad}$$

$$15 \times 5 \times 2 = \underline{\quad}$$

$$3 \times 10 \times 7 = \underline{\quad}$$

MULTIPLICATION STRATEGIES

Answer these using your times table knowledge.

$6 \times 7 = \underline{\quad}$

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

$8 \times 4 = \underline{\quad}$

$81 \div 9 = \underline{\quad}$

$5 \times 3 = \underline{\quad}$

$28 \div 7 = \underline{\quad}$

$9 \times 4 = \underline{\quad}$

$42 \div 6 = \underline{\quad}$

$7 \times 9 = \underline{\quad}$

$72 \div 8 = \underline{\quad}$

$9 \times 5 = \underline{\quad}$

$56 \div 7 = \underline{\quad}$



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

$70 \times 4 = \underline{\quad}$

$40 \times 7 = \underline{\quad}$

$6 \times 8 = \underline{\quad}$

$60 \times 8 = \underline{\quad}$

$80 \times 6 = \underline{\quad}$

$9 \times 5 = \underline{\quad}$

$90 \times 5 = \underline{\quad}$

$50 \times 9 = \underline{\quad}$

$3 \times 10 = \underline{\quad}$

$30 \times 10 = \underline{\quad}$

$100 \times 3 = \underline{\quad}$



To make multiplication easier, split the numbers into units, tens and hundreds. Multiply each part then add the products.

$$\begin{array}{r} 53 \\ \times 6 \\ \hline \end{array}$$

$\rightarrow 3 \times 6 = 18$
 $\rightarrow 50 \times 6 = 300$
 $\underline{318}$

$$\begin{array}{r} 247 \\ \times 4 \\ \hline \end{array}$$

$\rightarrow 7 \times 4 = 28$
 $\rightarrow 40 \times 4 = 160$
 $\rightarrow 200 \times 4 = 800$
 $\underline{988}$

$$\begin{array}{r} 93 \\ \times 7 \\ \hline \end{array}$$

$3 \times 7 =$

$90 \times 7 =$

$$\begin{array}{r} 52 \\ \times 3 \\ \hline \end{array}$$

$2 \times 3 =$

$50 \times 3 =$

$$\begin{array}{r} 29 \\ \times 8 \\ \hline \end{array}$$

$9 \times 8 =$

$20 \times 8 =$

MULTIPLICATION STRATEGIES

To make multiplication easier, split the numbers into units, tens and hundreds. Multiply each part then add the products.

$$\begin{array}{r} 47 \\ \times 6 \\ \hline \end{array}$$

$7 \times 6 =$

$40 \times 6 =$

$$\begin{array}{r} 77 \\ \times 5 \\ \hline \end{array}$$

$7 \times 5 =$

$70 \times 5 =$

$$\begin{array}{r} 68 \\ \times 3 \\ \hline \end{array}$$

$8 \times 3 =$

$60 \times 3 =$



$$\begin{array}{r} 39 \\ \times 2 \\ \hline \end{array}$$

$9 \times 2 =$

$30 \times 2 =$

$$\begin{array}{r} 85 \\ \times 9 \\ \hline \end{array}$$

$5 \times 9 =$

$80 \times 9 =$

$$\begin{array}{r} 53 \\ \times 8 \\ \hline \end{array}$$

$3 \times 8 =$

$50 \times 8 =$



$$\begin{array}{r} 495 \\ \times 6 \\ \hline \end{array}$$

$5 \times 6 =$

$90 \times 6 =$

$400 \times 6 =$

$$\begin{array}{r} 162 \\ \times 4 \\ \hline \end{array}$$

$2 \times 4 =$

$60 \times 4 =$

$100 \times 4 =$

$$\begin{array}{r} 381 \\ \times 5 \\ \hline \end{array}$$

$1 \times 5 =$

$80 \times 5 =$

$300 \times 5 =$



$$\begin{array}{r} 256 \\ \times 8 \\ \hline \end{array}$$

$6 \times 8 =$

$50 \times 8 =$

$200 \times 8 =$

$$\begin{array}{r} 374 \\ \times 7 \\ \hline \end{array}$$

$4 \times 7 =$

$70 \times 7 =$

$300 \times 7 =$

$$\begin{array}{r} 215 \\ \times 2 \\ \hline \end{array}$$

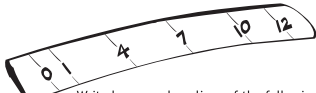
$5 \times 2 =$

$10 \times 2 =$

$200 \times 2 =$

THE MIGHTY RULER

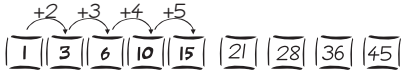
The ruler shown below is a bit different to others. However you can still draw lines for any of the measurements from 1 to 12 cm.



Write how you draw lines of the following lengths.

- 2 cm Use the distance between 10 and 12 cm
- 3 cm Use the distance between 1 and 4 cm
- 5 cm Use the distance between 7 and 12 cm
- 6 cm Use the distance between 4 and 10 cm
- 8 cm Use the distance between 4 and 12 cm
- 9 cm Use the distance between 1 and 10 cm
- 11 cm Use the distance between 1 and 12 cm

Find the pattern then write the next 4 numbers.



5

BRAIN EXTENSIONS

Find the pattern and complete the missing pieces.

8	11	10	13	14	11	17	14
5	7	8	6	9	4	11	6
3	4	2	7	5	7	6	8
15	28	16	42	45	28	66	48

There are two ways of using 9 8 7 6 5 4 3 2 1 and the + sign to get a sum total equal to 99. Below is the one of the ways:

$$9 + 8 + 7 + 65 + 4 + 3 + 2 + 1 = 99$$

Write the other sum.

$$9 + 8 + 7 + 6 + 5 + 43 + 21 = 99$$

The numbers 1 to 9 can be put into these squares so that each set of 3 numbers adds to the same sum. Put the missing numbers into the correct squares.



6

ODDS AND EVENS

Are these numbers odd or even?

35 Odd Even

43 Odd Even

52 Odd Even

94 Odd Even

71 Odd Even

60 Odd Even

36 Odd Even

87 Odd Even

18 Odd Even

29 Odd Even

Which of these numbers can you divide exactly by 2? Give a ✓ for yes or a ✗ for no. Indicate whether each are they odd or even.

27 ✗ ODD 46 ✓ EVEN 33 ✗ ODD 50 ✓ EVEN 89 ✗ ODD 68 ✓ EVEN

The last digit tells you if a number is odd or even. If the last digit is 1, 3, 5, 7 or 9 then the number is ODD.

If the last digit is 0, 2, 4, 6, or 8, then the number is even.

7

PLACE VALUE

Write in the answers.

8514 is a 4 digit number. It is made up of eight thousands five hundreds, one ten and four units or ones.

In the number 3902 the digit 9 stands for nine hundred

In the number 6375 the digit 6 stands for six thousand

1783 is a 4 digit number. It is made up of one thousand

seven hundred eight tens and 3 units (ones)

Write the greatest and the smallest numbers that can be obtained from each set of cards.

Write down the digit value.

4520
Five hundred

3768
Six tens (sixty)

9103
Nine thousand

2300
Zero (no units)

8

NUMBERS TO 1000

Write down the number that each picture represents.

265

814

379

497

501

9

PLACE VALUE

Write the correct number.

TH H T U
5 2 3 6

TH H T U
8 5 4 9

TH H T U
3 7 1 4

TH H T U
2 6 0 3

TH H T U
2 0 0 5

10

Write the number and the number word.

2764
Two thousand seven hundred and sixty four

1320
One thousand three hundred and twenty

6040
Six thousand and forty

8105
Eight thousand one hundred and five

4000
Four thousand

7359
Seven thousand three hundred and fifty nine

11

PLACE VALUE

Write each as digits in the place-value table.

a. 1000, 100, 10, 1

b. 1000, 100, 10, 1

c. 1000, 100, 10, 1

TH	H	T	U
4	9	1	2
2	2	5	0
7	3	0	0

Write these numbers with words.

6024 Six thousand and twenty four

5109 Five thousand one hundred and nine

8372 Eight thousand three hundred and seventy two

3680 Three thousand six hundred and eighty

Write these as expanded numbers.

4569 = 4x1000 + 5x100 + 6x10 + 9x1

1800 = 1x1000 + 8x100

3705 = 3x1000 + 7x100 + 5x1

9253 = 9x1000 + 2x100 + 5x10 + 3x1

7408 = 7x1000 + 4x100 + 8x1

291 = 2x100 + 9x10 + 1x1

12

How many 3-digit numbers can be made from 841?

Complete the tree diagrams then list the numbers in descending order.

888, 884, 881, 848, 844, 841, 818, 814, 811

488, 484, 481, 448, 444, 441, 418, 414, 411

188, 184, 181, 148, 144, 141, 118, 114, 111

Complete the missing numbers if ↗ means +10 and ↘ means -15.

11870 → 11815 → 11860 → 11855

11880 → 11875 → 11870

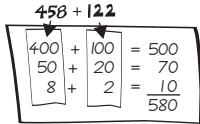
What does the → mean? → means -5

Add 1, 10, 100 and 1000 to the numbers in the table.

	+1	+10	+100	+1000
69	70	79	169	1069
1955	1956	1965	2055	2955
3290	3291	3300	3390	4290
9999	10000	10009	10099	10999

13

Partition the numbers then add each amount.



275 + 125 200 + 100 = 300 70 + 20 = 90 5 + 5 = 10 <hr/> 400	755 + 165 700 + 100 = 800 50 + 60 = 110 5 + 5 = 10 <hr/> 920	195 + 135 100 + 100 = 200 90 + 30 = 120 5 + 5 = 10 <hr/> 330
--	---	---

227 + 165 200 + 100 = 300 20 + 60 = 80 7 + 5 = 12 <hr/> 392	644 + 253 600 + 200 = 800 40 + 50 = 90 4 + 3 = 7 <hr/> 897	385 + 287 300 + 200 = 500 80 + 80 = 160 5 + 7 = 12 <hr/> 672
--	---	---

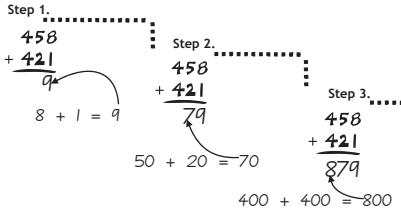
358 + 219 300 + 200 = 500 50 + 10 = 60 8 + 9 = 17 <hr/> 577	109 + 95 100 + 0 = 100 0 + 90 = 90 9 + 5 = 14 <hr/> 204	575 + 171 500 + 100 = 600 70 + 70 = 140 5 + 1 = 6 <hr/> 746
--	--	--

23

ADDITION IN COLUMNS

LEVEL 1

Add each column - units, tens, hundreds and thousands.



164 +323 <hr/> 487	492 +401 <hr/> 893	385 +212 <hr/> 597	530 +104 <hr/> 634	768 +121 <hr/> 889
--	--	--	--	--

7114 +2031 <hr/> 9145	5241 +1217 <hr/> 6458	6042 +2915 <hr/> 8957	3729 +2040 <hr/> 5769
---	---	---	---

24

553
+216

769

Answer the questions then crack the code.

K 132 +132 <hr/> 264	D 2141 +4632 <hr/> 6773	O 512 +327 <hr/> 839
I 385 +212 <hr/> 597	G 243 +651 <hr/> 894	N 8951 +1010 <hr/> 9961

What do you get if you cross a bell with a large gorilla?

A	D	I	N	G	O	K
264	6773	597	9961	894	6773	839

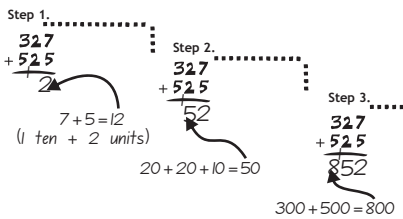
K	I	N	G	K	O	N
769	597	9961	894	769	839	9961

25

ADDITION IN COLUMNS

LEVEL 2

Add each column - units, tens, hundreds and thousands.



485 +106 <hr/> 591	238 +245 <hr/> 483	575 +217 <hr/> 792	819 +136 <hr/> 955	623 +157 <hr/> 780
--	--	--	--	--

2758 +4118 <hr/> 6876	7336 +1207 <hr/> 8543	5219 +1435 <hr/> 6654	1197 +2008 <hr/> 3205
---	---	---	---

26

145
+109

254

Answer the questions then crack the code.

A 578 +215 <hr/> 793	H 756 +128 <hr/> 884	U 517 +134 <hr/> 651
E 337 +116 <hr/> 453	R 107 +505 <hr/> 612	L 1428 +2007 <hr/> 3435
I 2177 +4113 <hr/> 6290	N 4344 +2108 <hr/> 6452	D 7529 +1149 <hr/> 8678

What are two things you cannot eat for breakfast?

L	U	N	C	H	A	N	D
3435	651	6452	254	884	793	6452	8678

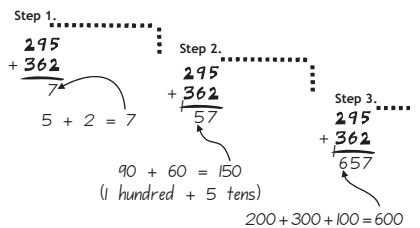
D	I	N	N	E	R
8678	6290	6452	6452	453	612

27

ADDITION IN COLUMNS

LEVEL 3

Add each column - units, tens, hundreds and thousands.



389 +260 <hr/> 649	382 +342 <hr/> 724	575 +171 <hr/> 746	491 +136 <hr/> 627	673 +251 <hr/> 924
--	--	--	--	--

2781 +4158 <hr/> 6939	2363 +1207 <hr/> 3570	2291 +435 <hr/> 2726	2297 +80 <hr/> 2377
---	---	--	---

28

Y 266 +151 <hr/> 417	O 342 +160 <hr/> 502	H 471 +372 <hr/> 843	G 695 +222 <hr/> 917
U 583 +241 <hr/> 824	I 114 +292 <hr/> 406	N 340 +388 <hr/> 728	L 765 +182 <hr/> 947
W 3240 +1260 <hr/> 4500	E 2176 +1262 <hr/> 3438	R 5094 +2082 <hr/> 7176	

4365
+261

4626

What did the hat say to the scarf?

Y	O	H	G
417	502	843	917

A	R	O	U
1831	7176	502	824

W	H	I	L
4500	843	406	947

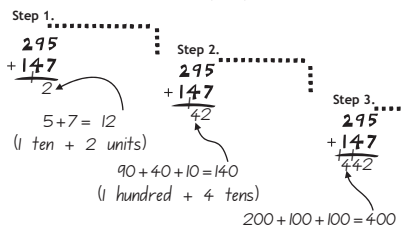
O	N	A	H	E	A	D
502	728	1831	843	3438	406	4626

29

ADDITION IN COLUMNS

LEVEL 4

Add each column - units, tens, hundreds and thousands.



469 +277 <hr/> 746	275 +335 <hr/> 610	276 +176 <hr/> 452	298 +146 <hr/> 444	184 +239 <hr/> 423
--	--	--	--	--

698 +212 <hr/> 910	305 +598 <hr/> 903	421 +199 <hr/> 620	545 +385 <hr/> 930
--	--	--	--

198 +664 <hr/> 862	408 +198 <hr/> 606	436 +378 <hr/> 814	287 +476 <hr/> 763
--	--	--	--

30

V 199 +156 <hr/> 355	O 776 +156 <hr/> 932	L 187 +239 <hr/> 426	S 897 +37 <hr/> 934
I 119 +299 <hr/> 418	H 754 +169 <hr/> 923	T 553 +358 <hr/> 911	E 287 +194 <hr/> 481

Why are there so many Smiths in the phone directory?

T	H	E	Y	A	L	L
911	923	481	930	910	426	426

H	A	V	E
923	910	355	481

P	H	O	N	E	S
814	923	932	620	481	934

What cheese is made backwards?

E	D	A	M
481	763	910	606

What do you call a boomerang that doesn't work?

A	S	T	I	C	K
910	934	911	418	862	903

31

ADDITION IN COLUMNS

LEVEL 5

B 5763 +3489 ----- 9252	G 6978 +1538 ----- 8516	I 6626 +1497 ----- 8123	Y 2893 +1107 ----- 4000
A 6485 +2626 ----- 9111	H 2985 +2149 ----- 5134	D 3499 +2746 ----- 6245	W 1487 +2538 ----- 4025
U 2786 +3578 ----- 6364	T 4959 +359 ----- 5318	O 1954 +789 ----- 2743	L 3568 +799 ----- 4367

32

M 6787 +756 ----- 7543	S 8997 +298 ----- 9295	N 5568 +456 ----- 6024	E 501 +499 ----- 1000
---	---	---	--

What did one eye say to the other eye?

B E T W E E N

Y O U A N D M E

S O M E T H I N G

S M E L L S

33

SUBTRACTION STRATEGIES

$$\begin{array}{r} 456 \\ - 89 \\ \hline 367 \end{array}$$

1 Add 1 to 89 to get 90
10 Add 10 to 90 to get 100
300 Add 300 to 100 to get 400
50 Add 50 to 400 to get 450
6 Add 6 to 450 to get 456
367 Add up all the numbers from 89 to 456

Try these subtraction sums. Use the number lines below to help.

$$\begin{array}{r} 586 \\ - 78 \\ \hline \end{array}$$

$$\begin{array}{r} 324 \\ - 66 \\ \hline \end{array}$$

34

$$\begin{array}{r} 872 \\ - 92 \\ \hline 780 \end{array}$$

$$\begin{array}{r} 8 \\ 700 \\ + 72 \\ \hline 780 \end{array}$$

$$\begin{array}{r} 453 \\ - 85 \\ \hline 368 \end{array}$$

$$\begin{array}{r} 15 \\ 300 \\ + 53 \\ \hline 368 \end{array}$$

As you get more proficient with this method you can leave out some intermediate steps.

$$\begin{array}{r} 262 \\ - 17 \\ \hline 245 \end{array}$$

$$\begin{array}{r} 3 \\ 80 \\ 100 \\ + 62 \\ \hline 245 \end{array}$$

35

PARTITIONING

Partition these sums.

65 50 + 10 + 5	47 30 + 10 + 7
96 80 + 10 + 6	32 20 + 10 + 2
28 10 + 10 + 8	61 50 + 10 + 1
53 40 + 10 + 3	74 60 + 10 + 4
89 70 + 10 + 9	50 40 + 10 + 0

36

Partition these sums.

54 40 + 10 + 4	43 30 + 10 + 3
71 60 + 10 + 1	87 70 + 10 + 7
39 20 + 10 + 9	60 50 + 10 + 0
92 80 + 10 + 2	78 60 + 10 + 8
25 10 + 10 + 5	51 40 + 10 + 1

37

ARITHMETIC STRATEGIES

Complete these sums.

59 40 + 19	77 60 + 17	23 10 + 13
95 80 + 15	41 30 + 11	81 70 + 11
98 80 + 18	64 50 + 14	32 20 + 12

Partition the numbers to make each subtraction easier.

70 - 28 = 40 + 30 - 28 = 40 + 2 = 42	80 - 36 = 40 + 40 - 36 = 40 + 4 = 44
---	---

38

Partition the numbers to make each subtraction easier.

50 - 19 = 30 + 20 - 19 = 30 + 1 = 31	400 - 55 = 340 + 60 - 55 = 340 + 5 = 345
500 - 280 = 200 + 300 - 280 = 200 + 20 = 220	600 - 199 = 400 + 200 - 199 = 400 + 1 = 401
470 - 58 = 40 + 60 - 58 = 40 + 2 = 42	301 - 95 = 20 + 100 - 95 = 20 + 5 = 206
847 - 288 = 547 + 300 - 288 = 547 + 12 = 559	575 - 399 = 75 + 400 - 399 = 75 + 1 = 76

39

METHODS OF SUBTRACTION

$$\begin{array}{r} 625 \\ - 388 \\ \hline \end{array}$$

600 + 20 + 5
- 300 + 80 + 8

300 + 10 + 15
- 300 + 80 + 8

500 + 10 + 15
- 300 + 80 + 8

200 + 30 + 7
= 237

We cannot subtract 8 from 5 but we can rewrite the top line

We cannot subtract 80 from 10 but we can rewrite the top line again

Rewrite these equations then do the subtraction.

$$\begin{array}{r} 531 \\ - 169 \\ \hline \end{array}$$

500 + 30 + 1 = 500 + 20 + 11 = 400 + 120 + 11
- 100 + 60 + 9 = - 100 + 60 + 9 = - 100 + 60 + 9

300 + 60 + 2 = 362

$$\begin{array}{r} 345 \\ 167 \\ \hline \end{array}$$

300 + 40 + 5 = 300 + 30 + 15 = 200 + 130 + 15
100 + 60 + 7 = 100 + 60 + 7 = 100 + 60 + 7

= 178

40

454
-385 Rewrite these equations then do the subtraction.

$400 + 50 + 4 \Rightarrow 400 + 40 + 14 \Rightarrow 300 + 140 + 14$
 $-300 + 80 + 5 \Rightarrow -300 + 80 + 5 \Rightarrow 300 + 80 + 5$
 $60 + 9$

967
 -498 \Rightarrow 69

$900 + 60 + 7 \Rightarrow 900 + 50 + 17 \Rightarrow 800 + 150 + 17$
 $400 + 90 + 8 \Rightarrow -400 + 90 + 8 \Rightarrow -400 + 90 + 8$
 $400 + 60 + 9$

721
 -155 \Rightarrow 469

$700 + 20 + 1 \Rightarrow 700 + 10 + 11 \Rightarrow 600 + 110 + 11$
 $-100 + 50 + 5 \Rightarrow -100 + 50 + 5 \Rightarrow -100 + 50 + 5$
 $500 + 60 + 6$

440
 -192 \Rightarrow 566

$400 + 40 + 0 \Rightarrow 400 + 30 + 10 \Rightarrow 300 + 130 + 10$
 $100 + 90 + 2 \Rightarrow -100 + 90 + 2 \Rightarrow -100 + 90 + 2$
 $200 + 40 + 8$

\Rightarrow 248

41

PATTERNS

- Choose a number on the grid and circle it.
- Cross out all the numbers in the same row and column.
- Repeat this process until you have chosen 6 numbers.

3 28 12

32 19 17

4. Add up your chosen numbers.
 $3+28+12+32+19+17 = \dots$

Choose three more sets of 6 numbers and find the sum of each.

sum = \dots sum = \dots sum = \dots

42

SUBTRACTION IN COLUMNS

LEVEL 1 Subtract the digits in each column - units, tens, hundreds and thousands.

278
 -152
 126
 $8-2=6$
 $70-50=20$
 $200-100=100$

465 391 874 725
 -241 -280 -123 -303
 224 111 751 422

6852 4395 6997 7368
 -2542 -1060 -6314 -6113
 4310 3335 683 1255

Answer the questions then crack the code.

896 688 798 412
 -790 -508 -621 -211

D 106 **A** 180 **B** 177 **R** 201

4579 6879 9489
 -4212 -3474 -7065

O 367 **E** 3405 **L** 2424

What never asks questions but gets plenty of answers?

A 180 **D** 106 **O** 367 **O** 367 **R** 201 **B** 177 **E** 3405 **L** 2424 **L** 2424

43

SUBTRACTION IN COLUMNS

LEVEL 2 Answer the questions then crack the code.

Step 1. 957
 -129

Step 2. 957
 -129
 828
 $7-9=8$
 $40-20=20$
 $900-100=800$

Subtract the following

253 635 455 972 544
 -137 -306 -219 -435 -128
 116 329 236 537 416

483 565 823 342 690
 -129 -138 -509 -117 -476
 354 427 314 225 214

2867 3392 4546 1650
 -1439 -1108 -2117 -1512
 1428 2284 2429 138

44

651 782 234
 -313 -205 -18
L 338 **G** 577 **H** 216

746 1985 5341
 -539 -1237 -2028
R 207 **D** 748 **C** 3313

4674 7641 8672
 -1519 -3205 -1137
Y 3155 **T** 4436 **E** 7535

What happens to old bicycles?

T 4436 **H** 216 **E** 7535 **Y** 3155 **G** 577 **E** 7535 **T** 4436

R 207 **E** 7535 **C** 3313 **C** 3313 **L** 2429 **E** 7535 **D** 748

45

SUBTRACTION IN COLUMNS

LEVEL 3 Answer the questions then crack the code.

Step 1. 528
 -246

Step 2. 528
 -246
 282
 $8-6=2$
 $120-40=80$
 $400-200=200$

Subtract the following

839 843 655 675 817
 -275 -180 -393 -395 -251
 564 663 262 280 566

784 518 809 317 637
 -291 -135 -453 -172 -486
 493 383 356 145 151

5728 2572 4236 3978
 -1439 -1108 -1082 -1181
 4289 1464 3154 2797

46

323 769 548 465
 -150 -282 -286 -274
I 173 **N** 487 **M** 262 **Y** 191

2978 4621 3445 1620
 -181 -1270 -2070 -1190
B 2797 **H** 3351 **A** 1375 **S** 430

5649 7208 2928
 -3063 -1134 -1083
L 2586 **T** 6074 **E** 1845

Where do teachers come from?

T 6074 **H** 3351 **E** 1845

A 1375 **S** 430 **E** 1845 **M** 262 **B** 2797 **L** 2586 **Y** 191

L 2586 **T** 6074 **E** 1845

47

SUBTRACTION IN COLUMNS

LEVEL 4 Answer the questions then crack the code.

Step 1. 824
 -396

Step 2. 824
 -396
 428
 $4-6=8$
 $700-300=400$
 $40-20=20$

Step 3. 824
 -396
 428

Subtract the following

655 645 943 333 525
 -198 -368 -299 -185 -236
 457 277 644 148 289

6842 4243 3911 6716
 -2476 -1047 -2545 -5089
 4366 3196 1366 1627

48

258 856 523 611
 -159 -278 -156 -463
U 99 **B** 578 **V** 367 **N** 148

467 732 514 852
 -269 -447 -435 -399
D 198 **F** 285 **L** 79 **S** 453

4567 6724 1211 3481
 -3063 -2388 -79 -382
O 1504 **R** 4336 **T** 1132 **E** 3099

Some helpful advice ...

D 198 **O** 1504 **N** 148 **T** 1132 **E** 3099 **V** 367 **E** 3099 **R** 4336

B 578 **E** 3099 **T** 1132 **O** 1504 **O** 1504

F 285 **U** 99 **L** 79 **L** 79 **F** 285 **O** 1504 **R** 4336

D 198 **E** 3099 **S** 453 **S** 453 **E** 3099 **R** 4336 **T** 1132

49

SUBTRACTION IN COLUMNS

LEVEL 5

Answer the questions then crack the code.

$$\begin{array}{r} 8344 \\ -5555 \\ \hline D\ 2789 \end{array}$$

$$\begin{array}{r} 5388 \\ -3799 \\ \hline G\ 1589 \end{array}$$

$$\begin{array}{r} 4382 \\ -1495 \\ \hline N\ 2887 \end{array}$$

$$\begin{array}{r} 6112 \\ -2284 \\ \hline S\ 3828 \end{array}$$

$$\begin{array}{r} 8153 \\ -4785 \\ \hline V\ 3368 \end{array}$$

$$\begin{array}{r} 7000 \\ -1567 \\ \hline F\ 5433 \end{array}$$

$$\begin{array}{r} 6000 \\ -2593 \\ \hline W\ 3407 \end{array}$$

$$\begin{array}{r} 5500 \\ -2461 \\ \hline C\ 2539 \end{array}$$

$$\begin{array}{r} 8678 \\ -1989 \\ \hline Y\ 6689 \end{array}$$

$$\begin{array}{r} 2479 \\ -999 \\ \hline H\ 1480 \end{array}$$

$$\begin{array}{r} 1263 \\ -585 \\ \hline E\ 678 \end{array}$$

$$\begin{array}{r} 7172 \\ -1997 \\ \hline R\ 5175 \end{array}$$

$$\begin{array}{r} 4867 \\ -2788 \\ \hline T\ 2079 \end{array}$$

$$\begin{array}{r} 9352 \\ -2769 \\ \hline U\ 6583 \end{array}$$

$$\begin{array}{r} 3821 \\ -1888 \\ \hline A\ 1933 \end{array}$$

$$\begin{array}{r} 2051 \\ -177 \\ \hline O\ 1874 \end{array}$$



50

Some helpful advice ...

NEVER
2887 678 3368 678 5175



TRUST
2079 5175 6583 3828 2079

A
1933

DOG
2789 1874 1589

TO
2079 1874



WATCH
3407 1933 2079 2539 1480

YOUR
6689 1874 6583 5175

FOOD
5433 1874 1874 2789



51

ARITHMETIC GALORE

Fill in the boxes to complete the sums.

$$\begin{array}{r} 2000 \\ + 2600 \\ \hline 4600 \end{array}$$

$$\begin{array}{r} 2865 \\ + 4135 \\ \hline 7000 \end{array}$$

$$\begin{array}{r} 325 \\ + 648 \\ \hline 973 \end{array}$$

$$\begin{array}{r} 3868 \\ + 1132 \\ \hline 5000 \end{array}$$

$$\begin{array}{r} 3500 \\ - 11472 \\ \hline 2028 \end{array}$$

$$\begin{array}{r} 3960 \\ - 2715 \\ \hline 1245 \end{array}$$

$$\begin{array}{r} 3479 \\ - 1471 \\ \hline 2008 \end{array}$$

$$\begin{array}{r} 4000 \\ - 2865 \\ \hline 1135 \end{array}$$

Circle two numbers in each box that add up to 100.

33 87 (23) 77 72 18 (28) 38 (56) 54 (44) 66

Circle two numbers in each box that add up to 500.

(37) 125 150 250 (455) 155 355 (45) (180) 380 (320)

Subtract each number from 1000.

1000 - 1 = 999 (99)

1000 - 50 = 950 (95)

1000 - 100 = 900 (90)

1000 - 125 = 875 (87)

1000 - 250 = 750 (75)

1000 - 355 = 645 (64)

1000 - 505 = 495 (49)

Complete the 3 digit subtraction below.

$$\begin{array}{r} 985 \\ - 202 \\ \hline 783 \end{array}$$

52

PEASANT MULTIPLICATION

The following is called the Russian Peasant Method of Multiplication e.g. 39×65

STEP 1

$$\begin{array}{r} 39 \quad 65 \\ 78 \quad 32 \\ 156 \quad 16 \\ 312 \quad 8 \\ 624 \quad 4 \\ 1248 \quad 2 \\ 2496 \quad 1 \end{array}$$

STEP 2 Put the numbers in two columns. Double each consecutive number in column 1. Each consecutive number in Column 2 (Omit remainders)

STEP 3 Add all the numbers in column 1 which are opposite odd numbers in column 2

$$\begin{array}{r} 39 \\ + 2496 \\ \hline 2535 \end{array}$$

THE ANSWER $39 \times 65 = 2535$

4×35

$$\begin{array}{r} 41 \quad 35 \\ 82 \quad 17 \\ 164 \quad 8 \\ 328 \quad 4 \\ 656 \quad 2 \\ 1312 \quad 1 \end{array}$$

66×27

$$\begin{array}{r} 66 \quad 27 \\ 132 \quad 13 \\ 264 \quad 6 \\ 528 \quad 3 \\ 1056 \quad 1 \end{array}$$

12×15

$$\begin{array}{r} 12 \quad 15 \\ 24 \quad 7 \\ 48 \quad 3 \\ 96 \quad 1 \end{array}$$

53

ARITHMETIC IN WORDS

The sum of two numbers is 3000. If the smaller number is 1250, what is the larger number?

$$\begin{array}{r} 3000 \\ - 1250 \\ \hline 1750 \end{array}$$

$$\begin{array}{r} 3000 \\ - 1250 \\ \hline 1750 \end{array}$$

The sum of two numbers is 5500. If the larger number is 3950, what is the smaller number?

$$\begin{array}{r} 5500 \\ - 3950 \\ \hline 1550 \end{array}$$

$$\begin{array}{r} 5500 \\ - 3950 \\ \hline 1550 \end{array}$$

A number, x, has 2500 added to it to make 6000. What is the number?

$$\begin{array}{r} x = 3500 \\ + 2500 \\ \hline 6000 \end{array}$$

$$\begin{array}{r} 6000 \\ - 2500 \\ \hline 3500 \end{array}$$

The difference between 550 and an unknown number is 250. What could the unknown number be?

$$\begin{array}{r} x = 300 \\ + 250 \\ \hline 550 \end{array}$$

$$\begin{array}{r} 550 \\ - 250 \\ \hline 300 \end{array}$$

$$\begin{array}{r} 550 \\ + 250 \\ \hline 800 \end{array}$$

$$\begin{array}{r} 550 \\ + 250 \\ \hline 800 \end{array}$$

54

Fastbake bakers can produce 125 loaves of bread each hour. How many can they produce in 8 hours?

1 hour 125 loaves

8 hours 250 250 250 250

Add 125 eight times
Or 250 four times
= 1000

Fastbake bakers purchase new ovens. Oven A produces 125 loaves of bread each hour. Oven B produces twice as many loaves as Oven A in 1 hour. Oven C produces three times as many loaves as Oven A in 1 hour.

How many loaves can the three machines produce in 4 hours?

Oven A = 125

Oven B = 250

Oven C = 375

750 Total (1 hr)

3000 Total (4 hrs)

Helen has 324 stamps. She has 3 times as many stamps as Michael. Peter has 3 times as many stamps as Helen. Calculate the total number of stamps from all three children.

Helen 324

Michael 108

Peter 972

Total 1404

55

ARITHMETIC IN WORDS

250 more than 4500 is the same as 250 less than ...? 5000

$$\begin{array}{r} 4500 \\ + 250 \\ \hline 4750 \end{array}$$

$$\begin{array}{r} 4750 \\ - 250 \\ \hline 4500 \end{array}$$

There are 2000 office workers in a building. 1250 of the office workers are male and the rest are female. How many more male than female are there?

2000

1250 male

750 female

1250 male

female x

= 500 more male

Royce has 30 cards. Alicia has twice as many cards as Royce. Mandy has three times as many cards as Alicia.

How many cards does Alicia have?
How many cards does Mandy have?

Royce 30

Alicia 30 30

Mandy 30 30 30 30 30 30

56

The difference between two numbers is 150. If the sum of the two numbers is 500, what are the values of each number?

Smaller number: x

Larger number: x + 150

$$\begin{array}{r} 500 \\ - 150 \\ \hline 350 \end{array}$$

$$\begin{array}{r} 175 \\ + 175 \\ \hline 350 \end{array}$$

$x + x + 150 = 500$

Smaller number = 175

Large number = 325

Daniel and Daisy put all their savings together to purchase a car. In total they have \$2500 however Daniel has \$260 more than Daisy. Their mother, Helen, contributes twice as much as Daniel. How much money does each contribute and how much is there in total?

Daisy 1120 x

Daniel 1120 x + 260

Helen 1380

$x + x + 260 = 2500$

ANSWER

2 units + 260 = 2500

Each unit = \$1120

Daisy contributes \$1120

Daniel contributes \$260 more i.e. \$1380

Helen contributes \$2760

Total of \$5260

57

BASIC FRACTIONS

Can you recognise the main fractions? Write these fractions.

One half ... 2/2 ... Three quarters ... 3/4 ... Two fifths ... 2/5 ...

Five eighths ... 5/8 ... Seven tenths ... 7/10 ... One sixth ... 1/6 ...

Colour the boxes to indicate each fraction.

1/2

1/5

1/4

2/3

3/4

9/10

1/3

Show the fraction in different ways.

3/5

Show the fraction in different ways.

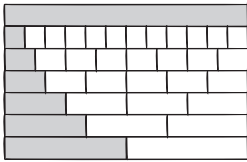
4/7

Show the fraction in different ways.

1/3

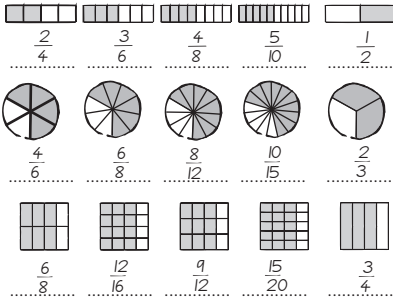
58

The strip shown is 1 unit long. What is the value of each shaded part?



1 unit
 one...twelfth... $\frac{1}{12}$
 one...eighth... $\frac{1}{8}$
 one...sixth... $\frac{1}{6}$
 one...fourth... $\frac{1}{4}$
 one...third... $\frac{1}{3}$
 one...half... $\frac{1}{2}$

Each row below shows equivalent fractions. Write down the fraction and the simplest fraction they are equivalent to.



59

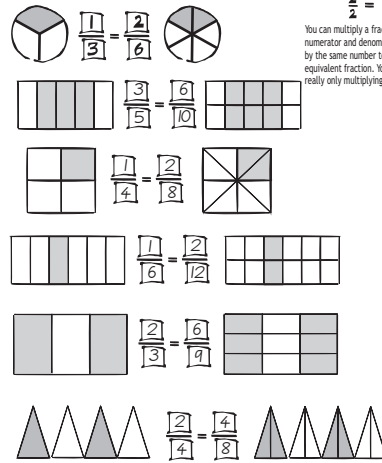
EQUIVALENT FRACTIONS

Equivalent fractions have the same value. Show what fraction of each figure is shaded.

$$\frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

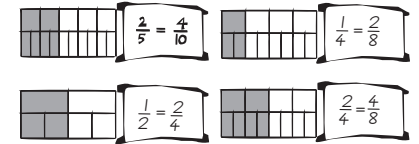
$$\frac{2}{2} = 1$$

You can multiply a fraction's numerator and denominator by the same number to get an equivalent fraction. You are really only multiplying by 1.

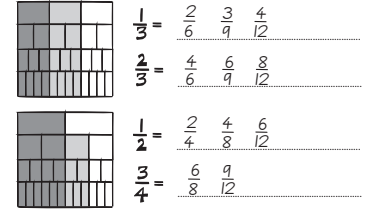


60

Write each of the equivalent fractions shown.



Write down and shade the equivalent fractions to the ones shown.



Complete each of the equivalent fractions.

$$\frac{1}{2} = \frac{5}{10} \quad \frac{1}{2} = \frac{3}{6} \quad \frac{1}{2} = \frac{8}{16} \quad \frac{2}{5} = \frac{4}{10} \quad \frac{5}{6} = \frac{10}{12}$$

$$\frac{24}{36} = \frac{12}{18} = \frac{6}{9} = \frac{2}{3} \quad \frac{18}{24} = \frac{9}{12} = \frac{3}{4}$$

61

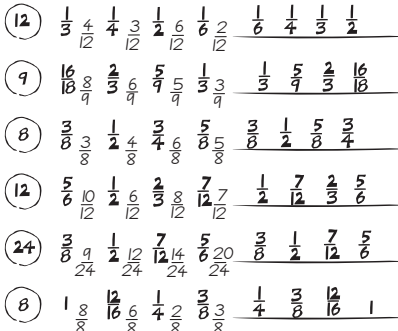
MORE FRACTIONS

Arrange $\frac{3}{4}$, $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{1}{2}$ in ascending order.

Hint: change each of the fractions into equivalent fractions with a denominator of 12 then put them in ascending order (smallest to largest).

$$\frac{3}{4} = \frac{9}{12} \quad \frac{2}{3} = \frac{8}{12} \quad \frac{5}{6} = \frac{10}{12} \quad \frac{1}{2} = \frac{6}{12}$$

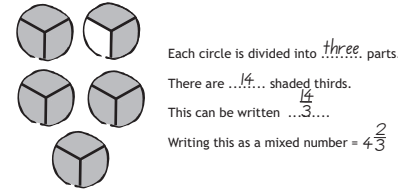
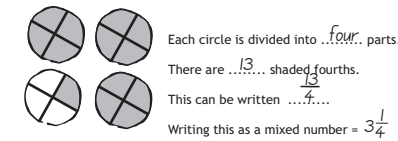
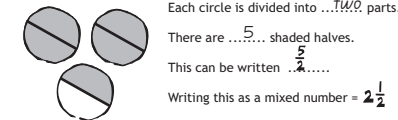
Put each group of fractions into ascending order. The number in the circle is a suggested denominator for equivalent fractions.



62

FRACTIONS GREATER THAN ONE

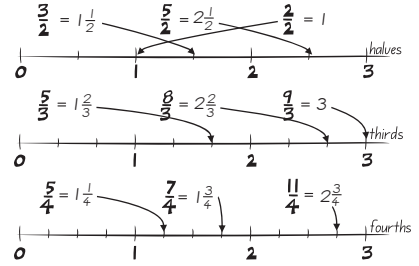
Complete each sentence.



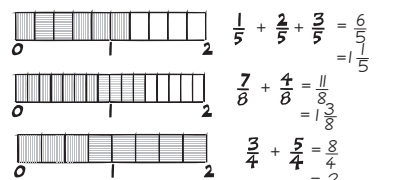
63

FRACTIONS GREATER THAN ONE

Write these numbers as mixed numbers then show each of them on the number line.



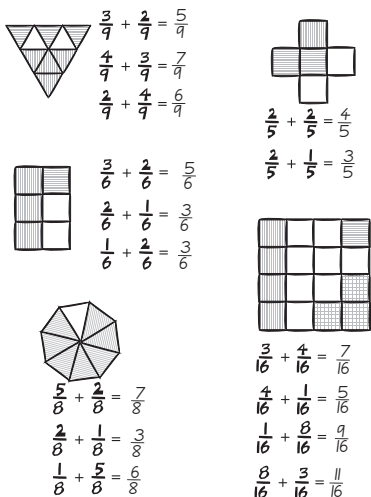
Add these fractions. The number strips might help.



64

FRACTION ARITHMETIC

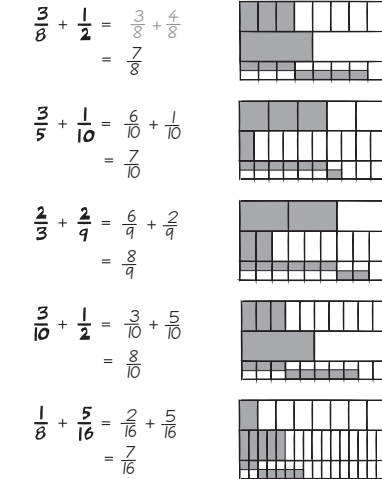
Complete each sum.



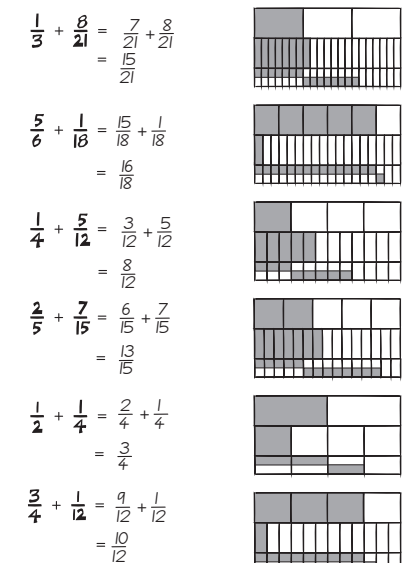
65

ADDING FRACTIONS

Add the fractions on these two pages. Before adding make sure each fraction has the same denominator.



66



67

ADDING FRACTIONS

Add the fractions on this page.
Before adding make sure each fraction has the same denominator.

$$\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$$



$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$



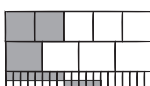
$$\frac{1}{6} + \frac{3}{4} = \frac{2}{12} + \frac{9}{12} = \frac{11}{12}$$



$$\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6} = \frac{5}{6}$$



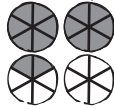
$$\frac{2}{5} + \frac{1}{4} = \frac{8}{20} + \frac{5}{20} = \frac{13}{20}$$



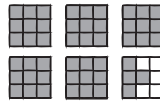
68

FINAL FRACTIONS

Answer all the questions.



Shade $2\frac{1}{3}$



How much is shaded? $5\frac{4}{9}$

Rename these fractions as a mixed or whole number.

$$\frac{15}{4} = 3\frac{3}{4} \quad \frac{9}{2} = 4\frac{1}{2} \quad \frac{12}{3} = 4 \quad \frac{10}{9} = 1\frac{1}{9}$$

Rewrite these mixed numbers as fractions.

$$4\frac{2}{3} = \frac{14}{3} \quad 5\frac{3}{4} = \frac{23}{4} \quad 2\frac{6}{6} = \frac{18}{6} \quad 1\frac{5}{2} = \frac{7}{2}$$

Add these fractions. Simplify if necessary.

$$\begin{array}{r} 3\frac{1}{2} \\ + 2\frac{2}{3} \\ \hline 5\frac{5}{6} \end{array} \quad \begin{array}{r} 5\frac{2}{3} \\ + 2\frac{1}{3} \\ \hline 7\frac{3}{3} = 8 \end{array} \quad \begin{array}{r} 2\frac{1}{8} \\ + 1\frac{3}{8} \\ \hline 4\frac{4}{8} = 4\frac{1}{2} \end{array} \quad \begin{array}{r} 3\frac{5}{9} \\ + 2\frac{1}{9} \\ \hline 5\frac{6}{9} = 5\frac{2}{3} \end{array}$$

Add these fractions.

$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4} \quad \frac{4}{6} + \frac{2}{6} = \frac{6}{6} \text{ or } 1 \quad \frac{6}{10} + \frac{4}{10} = \frac{10}{10} \text{ or } 1$$

$$\frac{4}{8} + \frac{4}{8} = \frac{8}{8} \text{ or } 1 \quad \frac{7}{6} + \frac{4}{6} = \frac{11}{6} \text{ or } 1\frac{5}{6} \quad \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

69

UNDERSTANDING \times AND \div

Complete each of the following:

$$25 + 25 + 25 + 25 + 25 = \frac{6}{150} \times 25 = 150$$

$$36 + 36 + 36 + 36 = 4 \times 36 = 144$$

$$18 + 18 + 18 + 18 + 18 + 18 + 18 = \frac{8}{144} \times 18 = 144$$

$$120 - 20 - 20 - 20 - 20 - 20 - 20 = 0 \quad \div 120 \div 20 = 6$$

$$56 - 8 - 8 - 8 - 8 - 8 - 8 = 0 \quad \div 56 \div 8 = 7$$

$$65 - 13 - 13 - 13 - 13 = 0 \quad \div 65 \div 13 = 5$$

Show that the product is the same regardless of the order.

$$5 \times 2 \times 15 = 150 \quad 7 \times 3 \times 10 = 210$$

$$2 \times 5 \times 15 = 150 \quad 10 \times 3 \times 7 = 210$$

$$15 \times 5 \times 2 = 150 \quad 3 \times 10 \times 7 = 210$$

70

MULTIPLICATION STRATEGIES

Answer these using your times table knowledge.

$$6 \times 7 = 42 \quad 30 \div 5 = 6 \quad 8 \times 4 = 32$$

$$81 \div 9 = 9 \quad 5 \times 3 = 15 \quad 28 \div 7 = 4$$

$$9 \times 4 = 36 \quad 42 \div 6 = 7 \quad 7 \times 9 = 63$$

$$72 \div 8 = 9 \quad 9 \times 5 = 45 \quad 56 \div 7 = 8$$

$$7 \times 4 = 28 \quad 70 \times 4 = 280 \quad 40 \times 7 = 280$$

$$6 \times 8 = 48 \quad 60 \times 8 = 480 \quad 80 \times 6 = 480$$

$$9 \times 5 = 45 \quad 90 \times 5 = 450 \quad 50 \times 9 = 450$$

$$3 \times 10 = 30 \quad 30 \times 10 = 300 \quad 100 \times 3 = 300$$

To make multiplication easier, split the numbers into units, tens and hundreds. Multiply each part then add the products.

$$\begin{array}{r} 53 \\ \times 6 \\ \hline 3 \times 6 = 18 \\ 50 \times 6 = 300 \\ \hline 318 \end{array}$$

$$\begin{array}{r} 247 \\ \times 4 \\ \hline 7 \times 4 = 28 \\ 40 \times 4 = 160 \\ 200 \times 4 = 800 \\ \hline 988 \end{array}$$

$$\begin{array}{r} 93 \\ \times 7 \\ \hline 3 \times 7 = 21 \\ 90 \times 7 = 630 \\ \hline 651 \end{array}$$

$$\begin{array}{r} 52 \\ \times 3 \\ \hline 2 \times 3 = 6 \\ 50 \times 3 = 150 \\ \hline 156 \end{array}$$

$$\begin{array}{r} 29 \\ \times 8 \\ \hline 9 \times 8 = 72 \\ 20 \times 8 = 160 \\ \hline 232 \end{array}$$

71

MULTIPLICATION STRATEGIES

To make multiplication easier, split the numbers into units, tens and hundreds. Multiply each part then add the products.

$$\begin{array}{r} 47 \\ \times 6 \\ \hline 7 \times 6 = 42 \\ 40 \times 6 = 240 \\ \hline 282 \end{array}$$

$$\begin{array}{r} 77 \\ \times 5 \\ \hline 7 \times 5 = 35 \\ 70 \times 5 = 350 \\ \hline 385 \end{array}$$

$$\begin{array}{r} 68 \\ \times 3 \\ \hline 8 \times 3 = 24 \\ 60 \times 3 = 180 \\ \hline 204 \end{array}$$

$$\begin{array}{r} 39 \\ \times 2 \\ \hline 9 \times 2 = 18 \\ 30 \times 2 = 60 \\ \hline 78 \end{array}$$

$$\begin{array}{r} 85 \\ \times 9 \\ \hline 5 \times 9 = 45 \\ 80 \times 9 = 720 \\ \hline 765 \end{array}$$

$$\begin{array}{r} 53 \\ \times 8 \\ \hline 3 \times 8 = 24 \\ 50 \times 8 = 400 \\ \hline 424 \end{array}$$

$$\begin{array}{r} 495 \\ \times 6 \\ \hline 5 \times 6 = 30 \\ 90 \times 6 = 540 \\ 400 \times 6 = 2400 \\ \hline 2970 \end{array}$$

$$\begin{array}{r} 162 \\ \times 4 \\ \hline 2 \times 4 = 8 \\ 60 \times 4 = 240 \\ 100 \times 4 = 400 \\ \hline 648 \end{array}$$

$$\begin{array}{r} 381 \\ \times 5 \\ \hline 1 \times 5 = 5 \\ 80 \times 5 = 400 \\ 300 \times 5 = 1500 \\ \hline 1905 \end{array}$$

$$\begin{array}{r} 256 \\ \times 8 \\ \hline 6 \times 8 = 48 \\ 50 \times 8 = 400 \\ 200 \times 8 = 1600 \\ \hline 2048 \end{array}$$

$$\begin{array}{r} 374 \\ \times 7 \\ \hline 4 \times 7 = 28 \\ 70 \times 7 = 490 \\ 300 \times 7 = 2100 \\ \hline 2618 \end{array}$$

$$\begin{array}{r} 215 \\ \times 2 \\ \hline 5 \times 2 = 10 \\ 10 \times 2 = 20 \\ 200 \times 2 = 400 \\ \hline 430 \end{array}$$

72

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- fractions, equivalent fractions and adding fractions
- multiplication strategies

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