

Make Ten (Stage 5, Book 5, page 26)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can add three or more numbers by first making up pairs that add up to 10. I am practising this.

1 Work out the answers by finding out pairs of numbers that add up to 10.

$6 + 8 + 4 + 4 + 2 = \square$

$5 + 6 + 4 + 4 + 5 = \square$

$9 + 8 + 5 + 5 + 2 = \square$

$3 + 8 + 7 + 4 + 2 = \square$

$6 + 8 + 4 + 4 + 2 = \square$

$4 + 8 + 6 + 4 + 2 = \square$

$3 + 8 + 7 + 9 + 2 = \square$

$8 + 1 + 4 + 2 + 9 + 6 = \square$

$6 + 7 + 4 + 8 + 3 = \square$

$1 + 5 + 4 + 5 + 9 + 6 = \square$

2 Work out the answers by first finding pairs of numbers that add up to 100.

$60 + 80 + 40 = \square$

$70 + 40 + 30 = \square$

$80 + 70 + 30 + 20 = \square$

$40 + 60 + 10 + 90 = \square$

Compatible Numbers (Stage 5, Book 5, page 26)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can add use compatible numbers to solve problems like $5 + 3 + 6 - 8$. I am practising this.

1 Work out the answers.

$6 + 8 + 4 - 10 = \square$

$8 + 7 - 3 - 4 = \square$

$10 - 8 - 2 + 3 = \square$

$1 + 5 + 7 - 8 = \square$

$6 + 8 - 4 - 4 + 2 = \square$

$4 + 7 + 4 - 8 = \square$

$3 + 8 - 7 - 1 + 2 = \square$

$10 + 1 + 4 - 5 = \square$

$10 + 8 - 4 - 8 + 6 = \square$

$7 + 5 - 4 - 1 = \square$

Subtraction in Parts (Stage 5, Book 5, page 27)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can subtract by splitting numbers into parts instead of counting down. I am practising this.

- 1 Kate worked out how to find $51 - 7$. She thought $51 - 1 = 50$, then $50 - 6 = 44$. Use Kate's method to fill in the boxes.

$$55 - 8: 55 - \square = 50 \quad \text{then } 50 - \square = \square$$

$$86 - 9: 86 - \square = 80 \quad \text{then } 80 - \square = \square$$

$$75 - 7: 75 - \square = 70 \quad \text{then } 70 - \square = \square$$

$$94 - 5: 94 - \square = 90 \quad \text{then } 90 - \square = \square$$

$$52 - 7: 52 - \square = 50 \quad \text{then } 50 - \square = \square$$

$$32 - 9: 32 - \square = 30 \quad \text{then } 30 - \square = \square$$

$$34 - 8: 34 - \square = 30 \quad \text{then } 30 - \square = \square$$

$$93 - 8: 93 - \square = 90 \quad \text{then } 90 - \square = \square$$

$$66 - 8: 66 - \square = 60 \quad \text{then } 60 - \square = \square$$

$$44 - 9: 44 - \square = 40 \quad \text{then } 40 - \square = \square$$

- 2 For $63 - 7$ Kate thinks $63 - 3 = 60$ then $60 - 4 = 56$. Use Kate's method to fill in the boxes.

$$27 - 8 = \square$$

$$16 - 9 = \square$$

$$52 - 5 = \square$$

$$41 - 7 = \square$$

$$74 - 7 = \square$$

$$85 - 8 = \square$$

$$93 - 6 = \square$$

$$33 - 9 = \square$$

$$65 - 7 = \square$$

$$73 - 8 = \square$$

$$25 - 7 = \square$$

$$43 - 9 = \square$$

$$56 - 8 = \square$$

$$66 - 9 = \square$$

$$83 - 6 = \square$$

- 3 Tom works out $54 - 9 - 8$ by first saying $54 - 9 = 45$, then $45 - 8 = 37$. Work these out using Tom's method.

$$45 - 9 - 7 = \boxed{} - \boxed{} = \boxed{}$$

$$57 - 9 - 8 = \boxed{} - \boxed{} = \boxed{}$$

$$73 - 8 - 8 = \boxed{} - \boxed{} = \boxed{}$$

$$36 - 8 - 7 = \boxed{} - \boxed{} = \boxed{}$$

$$66 - 7 - 9 = \boxed{} - \boxed{} = \boxed{}$$

$$92 - 6 - 9 = \boxed{} - \boxed{} = \boxed{}$$

$$81 - 5 - 7 = \boxed{} - \boxed{} = \boxed{}$$

$$84 - 9 - 7 = \boxed{} - \boxed{} = \boxed{}$$

- 4 Bigger Numbers. Work these out.

$$101 - 6 = \boxed{}$$

$$204 - 8 = \boxed{}$$

$$305 - 9 = \boxed{}$$

$$906 - 7 = \boxed{}$$

$$803 - 5 = \boxed{}$$

$$702 - 8 = \boxed{}$$

$$1005 - 8 = \boxed{}$$

$$2004 - 9 = \boxed{}$$

$$5003 - 7 = \boxed{}$$

$$8006 - 9 = \boxed{}$$

$$7001 - 7 = \boxed{}$$

$$4002 - 8 = \boxed{}$$

- 5 Now make up some subtractions of your own. Then work out the answers.

Up Over the Tens (Stage 5, Book 5, page 28)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can add by splitting numbers into parts to make tens. I am practising this.

- 1 Marie worked out how to find $58 + \square = 63$. She thinks 58 plus 2 is 60, 60 plus 3 is 63, so 2 plus 3 = 5.

Use Marie's method to work these out.

$18 + \square = 26$

$45 + \square = 54$

$66 + \square = 73$

$49 + \square = 57$

$88 + \square = 94$

$26 + \square = 34$

$39 + \square = 43$

$78 + \square = 82$

- 2 Work these out.

$98 + \square = 101$

$99 + \square = 105$

$96 + \square = 104$

$97 + \square = 106$

$299 + \square = 304$

$696 + \square = 704$

$897 + \square = 905$

$195 + \square = 202$

- 3 Work these out.

$98 + \square = 144$

$99 + \square = 136$

$96 + \square = 175$

$97 + \square = 116$

$198 + \square = 224$

$386 + \square = 393$

$699 + \square = 763$

$705 + \square = 711$

- 4 Do you like big numbers? Work these out.

$998 + \square = 1001$

$999 + \square = 1012$

$1996 + \square = 2022$

$2997 + \square = 3773$

Adding in Parts (Stage 5, Book 5, page 29)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can add by splitting numbers into parts. I am practising this.

- 1 Yesterday Mary worked out how to find $58 + 7$. She wrote down

$$58 + 7 = 60 + 5 = 65$$

Use Mary's method to fill in the boxes.

$$56 + 7 = 60 + \boxed{} = \boxed{}$$

$$85 + 9 = 90 + \boxed{} = \boxed{}$$

$$5 + 77 = 80 + \boxed{} = \boxed{}$$

$$7 + 39 = 40 + \boxed{} = \boxed{}$$

$$4 + 69 = 70 + \boxed{} = \boxed{}$$

$$6 + 78 = 80 + \boxed{} = \boxed{}$$

$$38 + 9 = 40 + \boxed{} = \boxed{}$$

$$27 + 9 = 30 + \boxed{} = \boxed{}$$

$$8 + 17 = 20 + \boxed{} = \boxed{}$$

$$5 + 49 = 50 + \boxed{} = \boxed{}$$

- 2 Use Mary's method to fill in the boxes.

$$27 + 8 = \boxed{} + 5 = \boxed{}$$

$$8 + 56 = \boxed{} + 4 = \boxed{}$$

$$45 + 7 = \boxed{} + 2 = \boxed{}$$

$$35 + 9 = \boxed{} + 4 = \boxed{}$$

$$6 + 78 = \boxed{} + 4 = \boxed{}$$

$$76 + 7 = \boxed{} + 3 = \boxed{}$$

$$69 + 8 = \boxed{} + 7 = \boxed{}$$

$$9 + 88 = \boxed{} + 7 = \boxed{}$$

- 3 Work these out.

$$27 + 9 = \boxed{}$$

$$5 + 67 = \boxed{}$$

$$9 + 35 = \boxed{}$$

$$7 + 34 = \boxed{}$$

$$58 + 3 = \boxed{}$$

$$88 + 4 = \boxed{}$$

$$9 + 79 = \boxed{}$$

$$9 + 46 = \boxed{}$$

- 4 Moana works out $59 + 6 + 8$ by first saying $59 + 6 = 65$, then $65 + 8 = 73$.
Work these out using Moana's method.

$45 + 9 + 7 = \square + \square = \square$	$5 + 67 + 9 = \square + \square = \square$
$76 + 8 + 8 = \square + \square = \square$	$7 + 36 + 8 = \square + \square = \square$
$66 + 7 + 9 = \square + \square = \square$	$6 + 56 + 3 = \square + \square = \square$
$79 + 5 + 3 = \square + \square = \square$	$9 + 7 + 86 = \square + \square = \square$

- 5 Bigger Numbers. Work these out.

$299 + 7 = \square + \square = \square$	$8 + 796 = \square + \square = \square$
$698 + 9 = \square + \square = \square$	$797 + 7 = \square + \square = \square$
$6 + 595 = \square + \square = \square$	$495 + 9 = \square + \square = \square$
$999 + 16 = \square + \square = \square$	$998 + 45 = \square + \square = \square$
$9996 + 57 = \square + \square = \square$	$4997 + 258 = \square + \square = \square$

- 6 Now make up some problems on your own. Then work out the answers or get a partner to do so.

Adding in Parts - Algebra (Stage 5, Book 5, page 29)

Teachers: this work is for students who have successfully completed "Adding in Parts - Using Number Properties", and have previously been taught the content of these sheets.

- 1 Jerry looked at $98 + 56$ and said this is the same as $100 + 54$ even though he did not work out the answer. How did he know?

- 2 For each of the following equations circle True or False. Do not add up the numbers on each side.

$97 + 47 = 100 + 44$ True/False $77 + 99 = 76 + 100$ True/False

$85 + 96 = 89 + 100$ True/False $63 + 70 = 66 + 67$ True/False

$97 + 47 = 100 + 50$ True/False $77 + 99 = 76 + 98$ True/False

$96 + 85 = 100 + 89$ True/False $63 + 70 = 66 + 73$ True/False

- 3 For each of the following fill in the box without adding the numbers up on each side.

$55 + 34 = 56 +$

$40 +$ $= 42 + 63$

$+ 5 = 43 + 3$

$5 + 34 = 8 +$

$5 +$ $= 2 + 53$

$+ 70 = 46 + 73$

$49 + 33 = 45 +$

$40 +$ $= 42 + 63$

$+ 5 = 63 + 3$

$11 + 37 = 15 +$

$50 +$ $= 60 + 30$

$+ 65 = 5 + 69$

- 4 Fill in the spaces to make a correct equation.

$7 +$ $= 9 +$

Write another two more equations using *different* numbers.

$7 +$ $= 9 +$

$7 +$ $= 9 +$

There is a relationship that is *always* true. Complete the statements.

The number in the box is *always* 2 than the number in the circle.

The number in the circle is *always* 2 than the number in the box.

5 The teacher writes $6 + \square = 2 + \bigcirc$ on the board.

Complete:

The number in the circle is *always* 4 than the number in the box.

Write two true statements for each of these. (Don't write any numbers in the spaces.)

$$52 + \square = 54 + \bigcirc$$

$$2 + \square = 6 + \bigcirc$$

$$12 + \square = 16 + \bigcirc$$

- 6 In algebra letters stand for *any* number. When you see them in textbooks letters are printed in *italic* to indicate that it is algebra
 Johnny completes $8 + n = 2 + (\dots\dots\dots)$ by using the compensation principle. He knows that because, 8 goes down 6 to 2, n must go up 6 to compensate. So Johnny writes $8 + n = 2 + (n + 6)$.
 Use compensation to fill in the spaces.

$$5 + n = 2 + (\dots\dots\dots)$$

$$6 + n = 9 + (\dots\dots\dots)$$

$$k + 5 = (\dots\dots\dots) + 2$$

$$m + 50 = (\dots\dots\dots) + 60$$

$$40 + x = 30 + (\dots\dots\dots)$$

$$14 + n = 15 + (\dots\dots\dots)$$

$$(\dots\dots\dots) + 15 = y + 17$$

$$(\dots\dots\dots) + 28 = n + 30$$

$$50 + (\dots\dots\dots) = 45 + x$$

$$10 + (\dots\dots\dots) = 20 + n$$

- 7 Fill in the empty spaces. Each letter stands for *any* number.

$$50 + (n + 2) = \dots\dots + n$$

$$6 + b = \dots\dots + (b - 3)$$

$$8 + (p - 4) = \dots\dots + p$$

$$8 + d = \dots\dots + (d + 2)$$

$$w + 6 = (w + 3) + \dots\dots$$

$$b + 9 = (b - 3) + \dots\dots$$

Comparisons and More Comparisons

(Stage 5, Book 5, pages 29 and 30)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can add and subtract using comparisons of sets without counting down or counting up. I am practising this.

- 1 Mrs Brown sets her class a problem. She says "Ro has \$68. Michael has \$9 more than Ro. How much money does Michael have?" Hone used a tidy number to find the answer. He said 'Two more dollars would be 70, so nine more than 68 needs another 7, which makes 77 dollars altogether. Mrs Brown writes up Hone's method as

$$68 + 9 = 68 + 2 + 7 = 77$$

Use Hone's method to solve the following problems.

7 more than 58: $58 + \square = 60 + \square + \square = \square$

6 more than 35: $35 + \square = 40 + \square + \square = \square$

5 more than 27: $27 + \square = 30 + \square + \square = \square$

9 more than 76: $76 + \square = 80 + \square + \square = \square$

4 more than 89: $89 + \square = 90 + \square + \square = \square$

- 2 Mrs Brown sets her class another problem. She says "Fee has \$73. Tony has \$8 less than Fee. How much money does Tony have?" Mia said "To find 8 less than 73, I subtracted 8 from 73. Three less than 73 is 70 and then I subtracted another 5 to make \$65. Mrs Brown wrote up Mia's method on the board:

$$73 - 3 = 70, 70 - 5 = 65$$

Use Mia's method to solve the following problems.

7 less than 52: $52 - \square = \square, 50 - \square = \square$

8 less than 44: $44 - \square = \square, 40 - \square = \square$

9 less than 33: $33 - \square = \square, 30 - \square = \square$

5 less than 61: $61 - \square = \square, 60 - \square = \square$

- 3 Mrs Brown sets her class another problem. She says 'Alex has 9 lollies. Sally has 16 lollies. How many more lollies does Sally have than Alex?'
Sam said 'I did $16 - 9$. First I subtracted 6 to get 10 and then I subtracted another 3 to get 7.' Mrs Brown writes $16 - 6 = 10$, $10 - 3 = 7$.

Work these out. Write down your method using Mrs. Brown's writing as a guide.
Alan has 18 lollies. Sue has 26 lollies. How many more lollies does Sue have than Alex?

Murray has 18 lollies. Kylie has 6 more lollies than Murray. How many lollies does Kylie have?

Ofisa has \$61. Miles has \$6 less than Ofisa. How much money does Miles have?

- | | | |
|---|--|---|
| 4 | Fiona has 59 lollies. Helen has 6 more lollies than Fiona.
How many lollies does Helen have? | <div style="border: 1px solid black; width: 60px; height: 35px; margin: 0 auto;"></div> |
| 5 | Pat has \$28. Kate has \$6 more than Pat. How much money does Kate have? | <div style="border: 1px solid black; width: 60px; height: 35px; margin: 0 auto;"></div> |
| 6 | Lynn has \$71. Toni has \$7 less than Lynn. How much money does Toni have? | <div style="border: 1px solid black; width: 60px; height: 35px; margin: 0 auto;"></div> |
| 7 | Sue has 43 sheep on her farm. Mac has 37 sheep on his farm.
How many more sheep does Sue have than Mac? | <div style="border: 1px solid black; width: 60px; height: 35px; margin: 0 auto;"></div> |

8 John has \$68. Waka has \$74. How much less than Waka does John have?

9 Kevin has \$58. Hiria has \$6 more than Kevin. How much money does Hiria have?

10 Tana has \$94. Mickie has \$7 less than Tana. How much money does Mickie have?

11 Jacqui has 33 goats on her farm. Mike has 25 goats on his farm. How many more goats does Jacqui have than Mike?

12 Now make up some problems on your own. Then work out the answers or get a partner to do so.

How Many Ten-Dollar Notes? (Stage 5, Book 5, page 31)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can find how many tens there are numbers less than 1000. I am practising this.

- 1 A bank only has ten-dollar notes and one-dollar coins. Murray withdraws \$234.

How many ten-dollar notes does Murray get? Answer =

How many one-dollar coins does Murray get? Answer =

- 2 Jean has 25 ten-dollar notes and 6 one-dollar coins.

How much money does Jean have altogether? Answer =

- 3 A bank only has ten-dollar notes and one-dollar coins. Fill in the spaces.

Money Withdrawn	Number of Ten-Dollar Notes	Number of One-Dollar Coins
\$78		
\$453		
\$201		
\$790		
\$900		
\$413		
	7	3
	63	2
	42	0
	60	7
	50	0
	81	1

- 4 Mr Hannah collects \$10 from each child in his class. If he has 31 children in his class how much money does he collect?
- 5 Boxes of chocolates cost \$10. How many boxes can Tara buy if she has \$191?
- 6 Jacqui sold 67 packets of hair ties for \$10 each. How much money has she collected?
- 7 Mrs Felise collected \$10 from each child in her class. She has collected \$280. How many children are there in her class?
- 8 Mr Fenn's class sold packets of lollies for \$10 each for a charity. If they made \$970 how many packets were sold?
- 9 Kylie buys 17 mini-pizzas for her birthday party. Mini-pizzas cost \$10 each. How much will this cost altogether?
- 10 Ben has \$203. How many friends can he take to the circus if tickets cost \$10 each?
- 11 Mr Nikora has \$266 to take the 25 students in his class to the circus. Tickets cost \$10 each. How much will he have left?
- 12 Inga sells model cars for \$10 each at a market. If he came home from the market with \$650 how many cars were sold?
- 13 Now make up some problems on your own. Then work out the answers or get a partner to work out the answers.

Saving Hundreds (Stage 6, Book 5, page 32)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can solve problems by knowing ten ones make one ten, and ten tens make 100 and this helps me to solve problems like $567 + \square = 800$. I am practising this.

1 Ray worked out $567 + \square = 800$ like this:

$567 + 3 = 570$, and he wrote down 3.

$570 + 30 = 600$, and he wrote down 30.

$600 + 200 = 800$, and he wrote down 200.

Ray's answer was 233. Use Ray's method to work these out. Do writing like Ray's in the spaces if that helps you.

Writing in Ray's Book
 $3 + 30 + 200 = 233$

$347 + \square = 500$

$182 + \square = 800$

$444 + \square = 700$

$557 + \square = 900$

$268 + \square = 1000$

$888 + \square = 1000$

$\square + 647 = 700$

$\square + 669 = 800$

$\square + 364 = 500$

$\square + 195 = 700$

$\square + 167 = 300$

$\square + 555 = 800$

2 More challenging.

$1947 + \square = 2000$

$4882 + \square = 5000$

$8494 + \square = 9000$

$7866 + \square = 8000$

$2268 + \square = 3000$

$4788 + \square = 5000$

$\square + 3947 = 4700$

$\square + 5869 = 6000$

$\square + 7694 = 8000$

$\square + 1980 = 2000$

$\square + 2580 = 3000$

$\square + 4444 = 5000$

Jumping the Number Line

(Stage 6, Book 5, page 33)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can imagine jumping through a tidy number on a number line to solve problems like $17 + \square = 91$. I am practising this.

1 Fill in the boxes.

$60 + \square = 80$

$10 + \square = 90$

$30 + \square = 70$

$20 + \square = 70$

$10 + \square = 40$

$60 + \square = 90$

$30 + \square = 80$

$50 + \square = 90$

$60 + \square = 100$

$10 + \square = 100$

$90 + \square = 110$

$80 + \square = 110$

$310 + \square = 340$

$960 + \square = 990$

$330 + \square = 380$

$450 + \square = 490$

2 Susan worked out how to find $50 + \square = 82$ by saying to herself $50 + 30$ gives 80, 30 and 2 is 32. Use Susan's method to work these out

$60 + \square = 85$

$10 + \square = 93$

$30 + \square = 74$

$20 + \square = 77$

$10 + \square = 42$

$60 + \square = 94$

$30 + \square = 83$

$50 + \square = 96$

$90 + \square = 103$

$90 + \square = 106$

$190 + \square = 202$

$390 + \square = 410$

$880 + \square = 902$

$960 + \square = 991$

- 3 Eric worked out $47 + \square = 82$ like this:
 $47 + 3 = 50$, and he wrote down 3.
 $50 + 30 = 80$, and he wrote down 30.
 $80 + 2 = 82$, and he wrote down 2.

Writing in Eric's Book
 $3 + 30 + 2 = 35$

Eric's answer was 35. Use Eric's method to work these out. Do writing like Eric's in the spaces if that helps you.

$58 + \square = 85$ <input style="width: 150px; height: 25px;" type="text"/> $26 + \square = 74$ <input style="width: 150px; height: 25px;" type="text"/> $29 + \square = 42$ <input style="width: 150px; height: 25px;" type="text"/> $27 + \square = 83$ <input style="width: 150px; height: 25px;" type="text"/> $38 + \square = 81$ <input style="width: 150px; height: 25px;" type="text"/> $56 + \square = 84$ <input style="width: 150px; height: 25px;" type="text"/> $49 + \square = 90$ <input style="width: 150px; height: 25px;" type="text"/> $25 + \square = 63$ <input style="width: 150px; height: 25px;" type="text"/>	$18 + \square = 93$ <input style="width: 150px; height: 25px;" type="text"/> $35 + \square = 71$ <input style="width: 150px; height: 25px;" type="text"/> $58 + \square = 94$ <input style="width: 150px; height: 25px;" type="text"/> $45 + \square = 90$ <input style="width: 150px; height: 25px;" type="text"/> $68 + \square = 94$ <input style="width: 150px; height: 25px;" type="text"/> $75 + \square = 91$ <input style="width: 150px; height: 25px;" type="text"/> $28 + \square = 74$ <input style="width: 150px; height: 25px;" type="text"/> $75 + \square = 94$ <input style="width: 150px; height: 25px;" type="text"/>
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- 5 Here are some more challenging problems. Have a go at them. Do writing like Eric's in the spaces if that helps you

$198 + \square = 245$ <input style="width: 150px; height: 25px;" type="text"/> $326 + \square = 371$ <input style="width: 150px; height: 25px;" type="text"/> $229 + \square = 542$ <input style="width: 150px; height: 25px;" type="text"/> $427 + \square = 783$ <input style="width: 150px; height: 25px;" type="text"/> $498 + \square = 600$ <input style="width: 150px; height: 25px;" type="text"/> $596 + \square = 800$ <input style="width: 150px; height: 25px;" type="text"/> $999 + \square = 1046$ <input style="width: 150px; height: 25px;" type="text"/>	$299 + \square = 343$ <input style="width: 150px; height: 25px;" type="text"/> $935 + \square = 971$ <input style="width: 150px; height: 25px;" type="text"/> $358 + \square = 694$ <input style="width: 150px; height: 25px;" type="text"/> $725 + \square = 990$ <input style="width: 150px; height: 25px;" type="text"/> $292 + \square = 605$ <input style="width: 150px; height: 25px;" type="text"/> $505 + \square = 832$ <input style="width: 150px; height: 25px;" type="text"/> $997 + \square = 1874$ <input style="width: 150px; height: 25px;" type="text"/>
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Don't Subtract - Add!

(Stage 6, Book 5, page 34)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I know that problems like $34 + \square = 51$ and $51 - 34 = \square$ have the same answer. I am practising this.

- 1 Jolene solves $92 - 88$ by seeing that $88 + \square = 92$ has the same answer. She says the answer is $2 + 2 = 4$. Use Jolene's addition method to work out these subtractions.

$54 - 49 = \square$

$105 - 97 = \square$

$86 - 78 = \square$

$107 - 98 = \square$

$93 - 86 = \square$

$103 - 94 = \square$

- 2 Jolene solves $92 - 68$ by adding 2 and 22 to get 24. Use Jolene's addition method to work out these subtractions.

$54 - 19 = \square$

$174 - 97 = \square$

$85 - 27 = \square$

$144 - 98 = \square$

$96 - 18 = \square$

$181 - 96 = \square$

- 3 Use an addition method to work out these subtractions.

$544 - 519 = \square$

$874 - 827 = \square$

$863 - 828 = \square$

$493 - 434 = \square$

$982 - 915 = \square$

$691 - 666 = \square$

- 4 Harder. Use an addition method to work out these subtractions.

$834 - 699 = \square$

$574 - 397 = \square$

$726 - 489 = \square$

$446 - 158 = \square$

$648 - 388 = \square$

$981 - 666 = \square$

Problems like $23 + \square = 71$

(Stage 6, Book 5, page 35)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can solve problems like $23 + \square = 71$ by jumping a tidy number on a number line then jumping back a small number. I am practising this.

1 Fill in the boxes. Do *not* jump along in tens.

$63 + \square = 83$

$12 + \square = 92$

$34 + \square = 74$

$23 + \square = 73$

$12 + \square = 42$

$64 + \square = 94$

$94 + \square = 104$

$82 + \square = 112$

$313 + \square = 343$

$961 + \square = 991$

$336 + \square = 386$

$453 + \square = 493$

$880 + \square = 902$

$960 + \square = 991$

2 Alex worked out how to find $43 + \square = 82$ by saying to himself $43 \text{ plus } 40 = 83$, so the answer is $40 - 1 = 39$. Use Eric's method to work these out.

$53 + \square = 81$

$12 + \square = 91$

$24 + \square = 70$

$45 + \square = 71$

$25 + \square = 72$

$58 + \square = 94$

$27 + \square = 83$

$45 + \square = 94$

$34 + \square = 81$

$65 + \square = 84$

$152 + \square = 181$

$375 + \square = 391$

$642 + \square = 691$

$525 + \square = 574$

$925 + \square = 963$

$275 + \square = 294$

How Many Tens and Hundreds? (Stage 6, Book 5, page 35)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can find how many tens and hundreds there are numbers over 1000. I am practising this.

- 1 A bank has one-hundred dollar notes, ten-dollar notes and one-dollar coins. Peter withdraws \$2334. How many hundred-dollar notes does Peter get?
Answer =

- 2 Jeanette has 25 one-hundred dollar notes, 8 ten-dollar notes and 3 one-dollar coins. How much money does Jeanette have altogether?
Answer =

- 3 A bank has one-hundred dollar notes, ten-dollar notes and one-dollar coins. Fill in the spaces.

Money Withdrawn	Number of \$100 notes	Number of \$10 notes	Number of \$1 coins
\$2334			
\$349			
\$2701			
\$410			
\$8990			
\$7099			
	6	2	8
	78	8	5
	60	7	2
	13	0	4
	67	3	0
	42	0	0

- 4 Max withdraws \$4500 from the bank in one-hundred dollar notes. How many one-hundred dollar notes does he get?
- 5 Rosie withdraws \$2389 from the bank in one-hundred dollar notes, ten-dollar notes and one-dollar coins. How many ten-dollar notes does she get?
- 6 Tickets for a concert cost \$100 each. How many tickets can Sarah buy if she has \$2518?
- 7 Mrs Felise collected \$100 from each of the 27 children in her class for a school camp. How much has she has collected?
- 8 Mr Green collected \$100 from each child in his class for a school camp. If he collected \$3100 how many children are there in his class?
- 9 Mrs Holt counts 68 one-hundred dollar notes at the end of the school fair? How much money has she counted?
- 10 Pale has saved \$2003. How many friends can he take to a concert if tickets cost \$100 each?
- 11 Mrs White has \$2660 to take the 26 students in her class to a concert. Tickets cost \$100 each. How much will she have left?
- 12 Jo's dad said skateboards for \$100 each at a market. If he came home from the market with \$5400 how many were sold?
- 13 Computer games cost \$100 each. Chrissie has \$2463. How much money will she have left?

Problems like $37 + \square = 79$ (Stage 6, Book 5, page 36)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can reverse add mentally the ones and tens separately when appropriate. I am practising this.

- 1 Jane works out $38 + \square = 89$ this way:
 $3 + 5 = 8, 8 + 1 = 9$, so the answer is 51.
Joel works out $38 + \square = 89$ this way:
 $30 + 50 = 80, 8 + 1 = 9$, so the answer is 51.
Would Jane's method be useful for $3218 + \square = 9989$? Why?

- 2 Use Jane's method to work out these.
- | | |
|---------------------|---------------------|
| $45 + \square = 86$ | $12 + \square = 99$ |
| $29 + \square = 89$ | $31 + \square = 54$ |
| $56 + \square = 96$ | $11 + \square = 77$ |
| $40 + \square = 76$ | $28 + \square = 88$ |

- 3 Use Jane's method to work out these.
- | | |
|---------------------|---------------------|
| $\square + 44 = 84$ | $\square + 82 = 99$ |
| $\square + 54 = 64$ | $\square + 22 = 98$ |
| $\square + 44 = 84$ | $\square + 50 = 93$ |
| $\square + 47 = 98$ | $\square + 23 = 93$ |

- 4 To work $\square - 41 = 26$ Jane says $\square = 41 + 26$.
- | | |
|---------------------|---------------------|
| $\square - 44 = 34$ | $\square - 32 = 40$ |
| $\square - 32 = 12$ | $\square - 18 = 81$ |
| $\square - 44 = 84$ | $\square - 28 = 11$ |

5 Work these out.

$$445 + \square = 456$$

$$812 + \square = 829$$

$$629 + \square = 689$$

$$131 + \square = 254$$

$$256 + \square = 396$$

$$11 + \square = 277$$

$$4444 + \square = 5555$$

$$6060 + \square = 8080$$

6 Solve these problems mentally by the *best* way you know. (Joel's method is often not the best way.)

$$\square + 65 = 91$$

$$885 + \square = 986$$

$$\square + 135 = 178$$

$$298 - \square = 100$$

$$\square + 397 = 403$$

$$98 - \square = 21$$

$$\square - 24 = 29$$

$$99 + \square = 701$$

$$\square - 23 = 300$$

$$888 - \square = 111$$

$$\square + 44,444 = 55,555$$

$$7999 + \square = 8023$$

7 Make up some problems where Joel's method is good. Make sure all numbers have at least four digits each.

Problems like $\square + 29 = 81$ (Stage 6, Book 5, page 37)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can reverse problems like $\square + 29 = 81$ to $29 + \square = 81$ and then use an appropriate mental method to solve the problem. I am practising this.

- 1 Jane has some sweets in a jar and her grandmother puts 36 more in it. Jane counts them and finds she has 71 sweets altogether. Ring the equation that matches this story.

$\square + 71 = 36$

$\square + 36 = 71$

$71 + \square = 36$

$36 + \square = 71$

- 2 Make up a word story for $\square + 299 = 371$.

- 3 Solve these problems mentally by the best way you know.

$\square + 45 = 81$

$\square + 298 = 345$

$\square + 35 = 88$

$\square + 288 = 399$

$\square + 97 = 181$

$\square + 32 = 91$

- 4 Solve these problems mentally by the best way you know.

$\square + 75 = 81$

$455 + \square = 585$

$\square + 135 = 178$

$298 + \square = 400$

$\square + 187 = 203$

$398 + \square = 454$

$\square + 896 = 980$

$99 + \square = 701$

$\square + 23 = 101$

$98 + \square = 454$

$\square + 1896 = 1980$

$3999 + \square = 6701$

When One Number is Near a Hundred (Stage 6, Book 5, page 37)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can solve some addition and subtraction problems by adjusting one number to the nearest hundred. I am practising this.

- 1 Yesterday Marcel worked out how to find $598 + 78$.

He wrote down $598 + 78 = 600 + 76 = 676$

Use Marcel's method to fill in the boxes.

$$597 + 86 = 600 + \boxed{} = \boxed{}$$

$$899 + 78 = 900 + \boxed{} = \boxed{}$$

$$99 + 175 = 100 + \boxed{} = \boxed{}$$

$$78 + 394 = 400 + \boxed{} = \boxed{}$$

$$48 + 795 = 800 + \boxed{} = \boxed{}$$

$$796 + 49 = 800 + \boxed{} = \boxed{}$$

$$392 + 58 = 400 + \boxed{} = \boxed{}$$

$$28 + 98 = 100 + \boxed{} = \boxed{}$$

$$497 + 27 = 500 + \boxed{} = \boxed{}$$

$$39 + 395 = 440 + \boxed{} = \boxed{}$$

- 2 Fill in the boxes

$$128 + 797 = 800 + \boxed{} = \boxed{}$$

$$495 + 336 = 500 + \boxed{} = \boxed{}$$

$$487 + 495 = 500 + \boxed{} = \boxed{}$$

$$175 + 698 = 700 + \boxed{} = \boxed{}$$

$$396 + 333 = 400 + \boxed{} = \boxed{}$$

$$795 + 666 = 800 + \boxed{} = \boxed{}$$

$$391 + 349 = 400 + \boxed{} = \boxed{}$$

$$186 + 294 = 300 + \boxed{} = \boxed{}$$

- 3 Yesterday Susan worked out how to find $512 - 98$.

She thought $512 - 100 = 412$, $412 + 2 = 414$. So the answer is 414. Use Susan's method to fill in the boxes.

$$333 - 99 = \boxed{}$$

$$369 - 97 = \boxed{}$$

$$777 - 98 = \boxed{}$$

$$407 - 98 = \boxed{}$$

$$224 - 96 = \boxed{}$$

$$982 - 97 = \boxed{}$$

4 Work these out.

$433 - 199 = \boxed{}$

$649 - 197 = \boxed{}$

$707 - 298 = \boxed{}$

$307 - 198 = \boxed{}$

$602 - 296 = \boxed{}$

$982 - 397 = \boxed{}$

$501 - 298 = \boxed{}$

$811 - 299 = \boxed{}$

5 Work these out.

$663 + 199 = \boxed{}$

$669 + 197 = \boxed{}$

$117 + 398 = \boxed{}$

$698 + 127 = \boxed{}$

$272 + 296 = \boxed{}$

$397 + 184 = \boxed{}$

$621 + 198 = \boxed{}$

$133 + 799 = \boxed{}$

6 If you like big numbers try these.

$4419 - 2998 = \boxed{}$

$4607 - 3998 = \boxed{}$

$999 + 3337 = \boxed{}$

$2997 + 1595 = \boxed{}$

$2994 + 66 = \boxed{}$

$3336 + 9994 = \boxed{}$

$998 + 4567 = \boxed{}$

$3945 - 2997 = \boxed{}$

$988 + 1012 = \boxed{}$

$8056 + 9994 = \boxed{}$

$99,999 + 55,011 = \boxed{}$

$458,232 - 99,998 = \boxed{}$

7 Make up some problems of your own and solve them.

When One Number is Near a Hundred - Algebra

(Stage 6, Book 5, page 37)

Teachers: this work is for students who have successfully completed "When One Number is Near a Hundred - Using Number Properties", and have previously been taught the content of these sheets.

- 1 Jerry looked at $98 + 56$ and said this is the same as $96 + 58$ even though he did not work out the answer. How did he know?

- 2 For each of the following equations circle True or False. Do not add up the numbers on each side.

$97 + 47 = 100 + 44$ True/False

$77 + 99 = 76 + 100$ True/False

$\frac{43}{11} + \frac{45}{11} = \frac{41}{11} + \frac{47}{11}$ True/False

$\frac{14}{89} + \frac{47}{89} = \frac{16}{89} + \frac{46}{89}$ True/False

$3.2 + 4.8 = 3.4 + 4.6$ True/False

$2.8 + 6.5 = 2.7 + 6.4$ True/False

- 3 For each of the following fill in the box without adding the numbers up on each side.

$49 + 33 = 45 + \square$

$40 + \square = 42 + 63$

$\square + 5 = 63 + 3$

$\frac{13}{26} + \frac{11}{26} = \frac{10}{26} + \frac{\square}{26}$

$\frac{13}{37} + \frac{\square}{37} = \frac{10}{37} + \frac{10}{37}$

$\frac{15}{89} + \frac{\square}{89} = \frac{18}{89} + \frac{67}{89}$

$1.4 + 2 = 1.1 + \square$

$58 + \square = 60 + 2$

$\square + 9 = 1.4 + 9.6$

- 4 Fill in the spaces to make a correct equation.

$59 + \square = 54 + \bigcirc$

There is a relationship that is *always* true between the numbers in the box and the circle. Complete the statements.

The number in the box is *always* 5 than the number in the circle.

The number in the circle is *always* 5 than the number in the circle box.

5 The teacher writes $66 + \square = 62 + \bigcirc$ on the board.

$$52 + \square = 54 + \bigcirc$$

$$8.22 + \square = 8.66 + \bigcirc$$

6 Fill in the spaces. Use the compensation principle. Each letter stands for *any* number.

$$75 + n = 72 + (\dots\dots\dots)$$

$$96 + n = 99 + (\dots\dots\dots)$$

$$k + 42 = (\dots\dots\dots) + 45$$

$$m + 300 = (\dots\dots\dots) + 400$$

$$(\dots\dots\dots) + 750 = y + 740$$

$$(\dots\dots\dots) + 28 = n + 30$$

7 Fill in the spaces. Use the compensation principle. Each letter stands for *any* number.

$$50 + (n + 20) = \dots\dots + n$$

$$60 + b = \dots\dots + (b - 30)$$

$$8.1 + (p - 8) = \dots\dots + p$$

$$8 + d = \dots\dots + (d + 7.8)$$

$$w + 600 = (w + 300) + \dots\dots$$

$$b + 90 = (b - 7) + \dots\dots$$

8 Use the patterns that you can see to write down equations that work for *any* numbers.

$$89 + 56 = (89 + 3) + (56 - 3)$$

so $a + b = (a + c) + (\dots\dots\dots)$

$$45 + 56 = (45 - 11) + (56 + 11)$$

so $w + b = (w - x) + (\dots\dots\dots)$

$$85 + 96 = (85 + 8) + (96 - 8)$$

so $f + b = f - c + (\dots\dots\dots)$

9 Pepe wrote down this correct equation: $a + b = (a + c) + (b - c)$

Phil wrote down this correct equation: $a + b = a + c + b - c$

Are Pepe's and Phil's equations the same?

Yes / No

Did Pepe need to put brackets in his equation?

Yes / No

10 Simplify.

$$(a + c) + (b - c) = \dots\dots\dots$$

$$(x + y) + (w - y) = \dots\dots\dots$$

$$(s + y) + (11 - y) = \dots\dots\dots$$

$$(18 - k) + (h + k) = \dots\dots\dots$$

Problems like $73 - 19 = \square$ (Stage 6, Book 5, page 38)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can solve problems like $73 - 19 = \square$ by first subtracting a tidy number then adding a small number to get the answer. I am practising this.

- 1 Josie works out $73 - 19$ by thinking that as 19 is so close to 20 it would be easy to subtract 20 and then add 1 back on. She writes $73 - 20 + 1 = 54$.

Use Josie's method to solve these problems.

$65 - 18 = \square$

$248 - 199 = \square$

$87 - 29 = \square$

$613 - 398 = \square$

$93 - 57 = \square$

$882 - 597 = \square$

- 2 Solve each of these problems mentally by the best way in each case.

$64 - 29 = \square$

$801 - 698 = \square$

$93 - 48 = \square$

$605 - 299 = \square$

$71 - 27 = \square$

$811 - 596 = \square$

- 3 Solve each of these problems mentally by the best way in each case.

$864 - 49 = \square$

$\square + 819 = 894$

$782 - 296 = \square$

$\square + 697 = 871$

$813 - 495 = \square$

$\square + 597 = 911$

$439 + \square = 488$

$798 + \square = 943$

- 4 Challenge. Solve each of these problems mentally by the best way in each case.

$3334 - 1999 = \square$

$\square + 6995 = 8991$

$7871 - 4995 = \square$

$\square + 66,996 = 88,883$

$100,001 - 99,996 = \square$

$\square + 94,997 = 100,003$

Equal Additions (Stage 6, Book 5, page 38)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can solve subtraction problems by equal additions that turn one of the numbers into a tidy number. Also I can solve problems by equal subtractions. I am practising this.

- 1 Norma has \$46 and Doreen has \$74. The problem is how much more money does Doreen have than Norma. Which equation matches the problem?

$$74 + 46 = \square \quad 74 + 46 = \square \quad 74 - 46 = \square \quad 46 - 74 = \square$$

- 2 Julie works out the difference between 71 and 19 by adding 1 to both numbers and seeing the difference between 72 and 20 is 52. Use Julie's method to find the difference between these numbers.

$$73 - 28 = \square$$

$$201 - 188 = \square$$

$$67 - 49 = \square$$

$$213 - 198 = \square$$

$$88 - 69 = \square$$

$$882 - 799 = \square$$

- 3 Manu works out the difference between 71 and 42 by subtracting 2 from both numbers and seeing the difference between 69 and 40 is 29. Use Manu's method to find the difference between these numbers.

$$51 - 22 = \square$$

$$201 - 183 = \square$$

$$60 - 44 = \square$$

$$211 - 194 = \square$$

$$70 - 12 = \square$$

$$880 - 403 = \square$$

- 4 Make up some examples for yourself and solve them.

Equal Additions - Algebra (Stage 6, Book 5, page 38)

Teachers: this work is for students who have successfully completed "When One Number is Near a Hundred - Using Number Properties", and have previously been taught the content of these sheets.

- 1 Pale looked at $793 - 97$ and said this is the same as $796 - 100$ even though he did not work out the answer. How did he know?

- 2 For each of the following ring True or False. Use the principle of equal additions.

$97 - 47 = 100 - 44$ True/False $377 - 69 = 380 - 72$ True/False

$85 - 96 = 89 - 100$ True/False $63 - 72 = 66 - 67$ True/False

$\frac{34}{79} - \frac{23}{79} = \frac{37}{79} - \frac{20}{79}$ True/False $\frac{4}{39} - \frac{3}{19} = \frac{4}{37} - \frac{3}{17}$ True/False

- 3 Bernice looked at $851 - 103$ and said this is the same as $848 - 100$ even though she did not work out the answer. How did she know?

- 4 For each of the following ring True or False. Use the principle of equal subtractions.

$2\frac{6}{7} - 1\frac{2}{7} = 2\frac{4}{7} - 1$ True/False $\frac{34}{39} - \frac{33}{39} = \frac{32}{39} - \frac{31}{39}$ True/False

$6.2 - 4.8 = 6 - 4.5$ True/False $7.81 - 6.51 = 7.71 - 6.42$ True/False

- 5 For each of the following fill in the box. Use the principle of equal subtractions or equal additions as appropriate.

$6 - 1\frac{2}{7} = 5\frac{6}{7} - \boxed{}$

$\boxed{} - 1 = 5\frac{6}{7} - 3$

$\boxed{} - 1\frac{1}{2} = 3 - 2\frac{1}{2}$

$4.9 - 3.3 = 4.5 - \boxed{}$

$4 - \boxed{} = 4.2 - 1.3$

$\boxed{} - 5 = 6.3 - 3$

$8.4 - 2 = 8.1 - \boxed{}$

$5.8 - \boxed{} = 6 - 0.3$

$\boxed{} - 1.5 = 9.6 - 1.6$

- 6 Fill in the brackets. Use the principle of equal subtractions or equal additions as appropriate. Each letter stands for *any* number.

$$n - 67 = (\dots\dots\dots) - 70$$

$$r - 55 = (\dots\dots\dots) - 52$$

$$5 - n = 9 - (\dots\dots\dots)$$

$$76 - n = 79 - (\dots\dots\dots)$$

$$k - 5 = (\dots\dots\dots) - 2$$

$$m - 50 = (\dots\dots\dots) - 40$$

$$40 - x = 50 - (\dots\dots\dots)$$

$$14 - n = 15 - (\dots\dots\dots)$$

$$(\dots\dots\dots) - 15 = y - 17$$

$$(\dots\dots\dots) - 33 = n - 30$$

$$50 - (\dots\dots\dots) = 55 - x$$

$$10 - (\dots\dots\dots) = 20 - n$$

- 7 Jenni simplifies $55 - (z + 5)$ by subtracting 5 from both parts. She writes $55 - (z + 5) = 50 - x$

Use Jenni's method to remove the brackets from these expressions.

$$34 - (z + 24) = \dots\dots\dots$$

$$4 - (3 + r) = \dots\dots\dots$$

$$100 - (z + 90) = \dots\dots\dots$$

$$34 - (q + 24) = \dots\dots\dots$$

$$45 + z - (z + 24) = \dots\dots\dots$$

$$10 + 3z - (3z + 4) = \dots\dots\dots$$

- 8 Maurie simplifies $15 - (x - 5)$ by adding 5 to both parts. He writes $15 - (x - 5) = 20 - x$.

Use Maurie's method to simplify these expressions.

$$12 - (z - 7) = \dots\dots\dots$$

$$15 - (3 + r) = \dots\dots\dots$$

$$10 - (f - 20) = \dots\dots\dots$$

$$4 - (d - 2) = \dots\dots\dots$$

$$20 - (3f - 20) = \dots\dots\dots$$

$$10 - (6k - 2) = \dots\dots\dots$$

$$10 - (f - 20) = \dots\dots\dots$$

$$14 - (2h - 6) = \dots\dots\dots$$

9 Use a rule of signs to write expressions without brackets.

$4 - (z - 7) = \dots\dots\dots$

$8 - (3 - 7g) = \dots\dots\dots$

$3 - (3u - 6) = \dots\dots\dots$

$5 - (1 - 0.5s) = \dots\dots\dots$

$4 - (z - 2.2) = \dots\dots\dots$

$3.7 - (3 - 7g) = \dots\dots\dots$

10 Write expressions without brackets.

$20 - (f - 20) + 3f = \dots\dots\dots$

$16 - (d - 2) + 2 + d = \dots\dots\dots$

$40 - (r + 20) - 10 + 3r = \dots\dots\dots$

$10 + 3z - (3z + 4) = \dots\dots\dots$

$k - 10 + 3p - (2p + 20) = \dots\dots\dots$

$2e + 4a - (2a - 2e) + 6a = \dots\dots\dots$

$2a + 4b - (2a - 2b) + 4 - 3a = \dots\dots\dots$

$25 + r + 4b - (20 - 2b) - 5r = \dots\dots\dots$

11 Write expressions without brackets.

$6z + 2d - (d - 2z) = \dots\dots\dots$

$4 + 4z - (z - 7) = \dots\dots\dots$

$4j - 2d - (d + 2j) = \dots\dots\dots$

$11 - 4k - (4k - 7) = \dots\dots\dots$

$11j - 12 - (7 + 2j) = \dots\dots\dots$

$13i - k - (k - 7i) = \dots\dots\dots$

$4j - 2p - (7g + 2j) = \dots\dots\dots$

$3i - 3k + 3e - (k - 7i) = \dots\dots\dots$

People's Ages (Stage 6, Book 5, page 39)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can apply mental subtraction methods to an application. I am practising this.

- 1 Joseph was born 21/06/1988. What was his age on his birthday in 2004? Answer =
- What was his age on 23/06/2005? Answer =
- What was his age on 15/02/2005? Answer =
- 2 Mary's great-grandmother was born 15/02/1865 and died 25/02/1941. Mary said her great-grandmother was $35 + 41$ when she died. Explain Mary's reasoning. What was her great grandmother's age when she died?

- 3 Jerry's great-great-grandmother was born 21/12/1849 and died 23/10/1922. to work out how long she lived Jerry worked out $49 + 22 = 71$. Jerry has to adjust this answer. Why? What was his great-great-grandmother's age when she died?

- 4 Make up some of your own age problems and work out the answer. Get a friend to check them.

A Balancing Act and Some Algebra (Stage 6, Book 5, page 40)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I understand that the answer on the left of the equals sign is the same as the answer on the right of the equals sign, and I apply this to solving equations.

- 1 Sue answers this problem by putting 10 in the box. $3 + 7 = \square + 4$. How did Sue get this wrong answer? How would you explain to Sue why it must be wrong?

Andrew thinks the number in the box for $3 + 7 = \square + 4$ is 14. How did Andrew get this answer? How would you explain to Andrew why it must be wrong?

- 2 Find the number in each box.

$$3 + 3 = \square + 5$$

$$9 + 3 = \square + 5$$

$$13 - 3 = \square + 5$$

$$12 - 3 = \square - 1$$

$$14 + \square = 12 + 5$$

$$12 - \square = 11 - 1$$

$$3 + \square = 9 - 4$$

$$12 - \square = 4 + 1$$

$$\square + 7 = 12 + 5$$

$$\square + 10 = 14 - 1$$

$$\square + 1.6 = 1.2 + 0.5$$

$$\square + 0.9 = 0.8 + 0.2$$

$$\frac{\square}{11} + \frac{3}{11} = \frac{5}{11} + \frac{4}{11}$$

$$\frac{5}{19} + \frac{\square}{19} = \frac{4}{19} + \frac{11}{19}$$

3 Solve these equations.

$12 + 18 = x + 5 \quad x = \dots\dots\dots$

$6 + 2 = y + 5 \quad y = \dots\dots\dots$

$19 - 11 = c + 5 \quad c = \dots\dots\dots$

$12 - 9 = k - 1 \quad k = \dots\dots\dots$

$11 + w = 12 + 5 \quad w = \dots\dots\dots$

$14 - j = 11 - 1 \quad j = \dots\dots\dots$

$3 + h = 12 - 4 \quad h = \dots\dots\dots$

$7 - m = 4 + 1 \quad m = \dots\dots\dots$

$x + 7 = 12 + 5 \quad x = \dots\dots\dots$

$q + 5 = 12 - 2 \quad q = \dots\dots\dots$

$n + 2.6 = 3 + 0.1 \quad n = \dots\dots\dots$

$u + 1.9 = 1.8 + 0.2 \quad u = \dots\dots\dots$

$x + \frac{5}{21} = \frac{4}{21} + \frac{4}{21} \quad x = \dots\dots\dots$

$\frac{19}{36} + w = \frac{18}{36} + \frac{5}{36} \quad w = \dots\dots\dots$

4 Find the number in each box.

$26 = \square + 5$

$93 = \square + 3$

$44 = \square - 5$

$13 = \square - 2$

$19 + \square = 22$

$12 - \square = 2$

$103 + \square = 108$

$99 - \square = 1$

$\square - 2 = 5$

$\square - 10 = 2$

$\square + 1.6 = 3$

$\square - 0.9 = 1$

5 Solve these equations. Write the answer beside each equation.

$12 = x + 5 \quad x = \dots\dots\dots$

$9 = y + 5 \quad y = \dots\dots\dots$

$19 = c + 5 \quad c = \dots\dots\dots$

$12 = k - 1 \quad k = \dots\dots\dots$

$11 - w = 7 \quad w = \dots\dots\dots$

$14 - j = 10 \quad j = \dots\dots\dots$

$3 + h = 8 \quad h = \dots\dots\dots$

$17 - m = 15 \quad m = \dots\dots\dots$

$x + 7 = 34 \quad x = \dots\dots\dots$

$q - 5 = 67 \quad q = \dots\dots\dots$

Near Doubles

(Stage 6, Book 5, page 41)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can to solve addition problems where the two numbers are easily related to doubles. I am practicing them.

- 1 Doug works out $88 + 88$ by saying $90 + 90 = 180$, $180 - 4 = 176$.
Dennis works out $88 + 88$ by saying $100 + 100 = 200$, $200 - 24 = 176$.
Which method is better? Why?

- 2 Use doubles to work out the answers.

$151 + 149 = \square$

$79 + 79 = \square$

$347 + 353 = \square$

$61 + 61 = \square$

$250 + 252 = \square$

$76 + 75 = \square$

$801 + 803 = \square$

$54 + 47 = \square$

- 3 Murray works out $141 - 69$ by saying $70 + 70 = 140$,
so the answer is $70 + 1 + 1 = 72$. Explain Murray's method.

- 4 Use doubles to work out the answers.

$151 - 75 = \square$

$81 - 39 = \square$

$300 - 148 = \square$

$61 - 31 = \square$

$250 - 126 = \square$

$101 - 48 = \square$

Near Doubles - Algebra (Stage 6, Book 5, page 41)

Teachers: this work is for students who have successfully completed "Near Doubles", and have previously been taught the content of these sheets.

1 Gillian works out $88 + 88$ by saying $90 + 90 = 180$, $180 - 4 = 176$.

She writes this down as $88 + 88 = (90 - 2) + (90 - 2)$

Complete the following in Gillian's style.

$$87 + 87 = (90 - \square) + (90 - \square) \quad 39 + 39 = (40 - \square) + (40 - \square)$$

$$38 + 38 = (\square + 8) + (\square + 8) \quad 34 + 34 = (\square + 2) + (\square + 2)$$

2 What does the letter equal in each case?

$$37 + 37 = (40 - n) + (40 - n) \quad n = \dots\dots\dots$$

$$52 + 52 = (50 + m) + (40 + m) \quad m = \dots\dots\dots$$

$$29 + 29 = (40 - j) + (40 - j) \quad j = \dots\dots\dots$$

$$52 + 52 = (50 + m) + (50 - m) \quad m = \dots\dots\dots$$

3 Matt decides to write down $88 + 88$ as a multiplication:

He writes the down as $88 + 88 = 2 \times (90 - 2)$

Complete the following in Matt's style.

$$57 + 57 = 2 \times (60 - \square) \quad 57 + 57 + 57 = 3 \times (50 + \square)$$

$$68 + 68 = 2 \times (70 - \square) \quad 34 + 34 + 34 + 34 = \square \times (30 + 4)$$

$$2.4 + 2.4 = 2 \times (2 + \square) \quad 0.98 + 0.98 + 0.98 + 0.98 = \square \times (1 - \square)$$

$$3\frac{3}{4} + 3\frac{3}{4} + 3\frac{3}{4} + 3\frac{3}{4} = \square \times (3 + \square)$$

$$\square \times (5 - 0.07) = \square + 4.93 + 4.93 + 4.93$$

4 What does the letter equal?

$$53 + 53 + 53 + 53 = 4(50 + g) \quad g = \dots\dots\dots$$

$$38 + 38 + 38 + 38 = 4(40 - p) \quad p = \dots\dots\dots$$

$$23 + 23 + 23 = 3(20 + g) \quad g = \dots\dots\dots$$

Three or More at a Time (Stage 6, Book 5, page 42)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can look at the addition and subtraction of three or more numbers to calculate easy combinations first.

- 1 Maria begins working $345 + 888 - 145$ by adding 345 and 888. What would have been a more sensible way to start?

- 2 Work out

$999 + 345 + 1 - 45 = \dots\dots\dots$

$1254 + 12 + 88 - 54 = \dots\dots\dots$

$8997 + 14 + 1003 = \dots\dots\dots$

$2222 - 212 - 10 = \dots\dots\dots$

$1056 - 58 + 2 = \dots\dots\dots$

$10,000 - 994 - 3 - 3 = \dots\dots\dots$

$69,899 + 102 - 1 = \dots\dots\dots$

$1254 + 800 - 1234 - 20 = \dots\dots\dots$

$1 + 345 + 100 + 999 = \dots\dots\dots$

$7,000 - 12 - 88 - 900 = \dots\dots\dots$

$9999 + 9999 + 2 = \dots\dots\dots$

$999,997 - 14 + 17 = \dots\dots\dots$

$124,890 - 23,890 - 1000 = \dots\dots\dots$

$17 + 17 + 56,789 - 34 = \dots\dots\dots$

- 3 These look hard. However, there is always an easy way. Work out:

$99.999 + 345.67 + 0.001 = \dots\dots\dots$

$3.4 + 6.6 + 45.8 + 0.2 = \dots\dots\dots$

$67.995 + 14 + 2.005 = \dots\dots\dots$

$11 - 6.7 - 3.3 = \dots\dots\dots$

$1,000,000.89 - 0.09 - 0.8 = \dots\dots\dots$

$0.8 - 0.03 - 0.77 = \dots\dots\dots$

$\frac{11}{91} - \frac{12}{91} + \frac{92}{91} = \dots\dots\dots$

$3 - \frac{12}{17} + \frac{2}{17} - \frac{7}{17} = \dots\dots\dots$

Three or More at a Time - Algebra (Stage 6, Book 5, page 42)

Teachers: this work is for students who have successfully completed "Three or More at a Time", and have previously been taught the content of these sheets.

- 1 Maria has a smart way to work out $998 - 37 + 1002 - 63$. She says the answer is 1900 by working out $998 + 1002 - (37 + 63)$. Is she correct? Why did Maria have to add brackets?

- 2 For each of the following equations circle True or False. Do not work out the answers to each side of the equations.

$42 - 28 + 18 - 12 = 42 + 18 - (28 + 12)$ True/False

$86 - (45 + 11) = 86 - 45 + 11$ True/False

$76 - 25 - 11 = 76 - (25 + 11)$ True/False

$66 - (15 + 21) = 66 - 15 + 21$ True/False

$66 - (15 + 21) = 66 - 15 - 21$ True/False

$266 - (5 + 91) + 45 = 266 + 45 - 5 - 91$ True/False

$266 - (5 + 91) + 45 = 266 + 45 - 5 + 91$ True/False

$56 - (15 + 11 + 14) = 56 - 15 - 11 - 14$ True/False

- 3 Fill in the boxes. Choose between a plus sign (+) and a subtraction sign (-).

$55 - (34 + 23) = 55 \square 34 \square 23$

$35 - (24 + 13) = 35 \square 24 \square 13$

$60 \square (4 \square 18) = 60 - 4 - 18$

$20 \square (2 \square 67) = 20 - 2 - 67$

4 The letters stand for any number. For each of the following equations circle True or False.

$$34 - k + 18 - 12 = 34 + 18 - (k + 12) \quad \text{True/False}$$

$$45 - k + 18 - m = 45 + 18 - (k + m) \quad \text{True/False}$$

$$14 + t - (48 + y) = 14 + t - 48 + y \quad \text{True/False}$$

$$23 - (m + f + q) = 23 - m - f + q \quad \text{True/False}$$

$$34 - k + 18 - 12 = 34 + 18 - (k + 12) \quad \text{True/False}$$

5 The letters stand for a certain number. What is the number?

$$26 - k + 34 - 12 = 26 + 34 - (8 + 12) \quad k = \dots\dots\dots$$

$$99 - 43 + c + 19 = 99 + 12 - (43 + 19) \quad c = \dots\dots\dots$$

$$29 - 12 - 18 = 29 - (r + 18) \quad r = \dots\dots\dots$$

6 The letters stand for any numbers. Complete the equations without brackets.

$$w - (q + c + 19) = \dots\dots\dots$$

$$a + e - (z + m) = \dots\dots\dots$$

$$p + w + r - (k + d) = \dots\dots\dots$$

$$j - (n + c + x) = \dots\dots\dots$$

$$q - (p + c + d + 9) = \dots\dots\dots$$

Large Numbers (Stage 6, Book 5, page 43)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I understand how a number rolls over when 10 of any unit occur in an addition, and how the number rolls back when 10 of any unit occur in a subtraction. I am practising this.

- 1 Assume you have one dollar, ten dollar, hundred dollar, thousand dollar, ten-thousand dollar, hundred-thousand dollar, million dollar, ten-million dollar, hundred-million dollar, and billion dollar notes at your bank.

Bill has \$204, 608, 753 in his account. He withdraws notes representing the 6 in this number. He now has \$204, 008, 753. What words and number are written on each note?

Fill in this table:

Amount in Bank	Withdrawal	Notes withdrawn in words	Balance
\$4,444,762	\$40,000	Four ten-thousands	
\$39,902	\$30,000		
\$943,759		Three thousands	
\$898,900,009		Nine ten-millions	
\$5,128,449			\$5,128,049
		Nine hundreds	\$45,023
		Seven billions	\$333,545,023

2 Fill in the boxes:

$99,999 + 601 = \boxed{}$

$9,988 + 12 + 1 = \boxed{}$

$11 + 99,989 = \boxed{}$

$8999 + 8999 = \boxed{}$

$2 + 9,999,999 = \boxed{}$

$999,999 + 999,999 = \boxed{}$

$9998 + \boxed{} = 10,046$

$99 + \boxed{} = 1098$

$\boxed{} + 99,999 = 100,008$

$\boxed{} + 6997 = 7,026$

3 Fill in the boxes:

$100,001 - 8 = \boxed{}$

$10,014 - 16 = \boxed{}$

$1,000,004 - 12 = \boxed{}$

$100,001 - 99,996 = \boxed{}$

$994 + \boxed{} = 1002$

$99,999 + \boxed{} = 100,007$

$3 + \boxed{} = 10,002$

$4 + \boxed{} = 1,000,002$

$100,001 - 99,998 = \boxed{}$

$10,000,002 - 9,999,999 = \boxed{}$

4 Four friends each have \$9997 as a result of a Lotto win. How much was the total prize?

5 Five friends win a total of \$49,995 at Lotto. It is Harriet's job to work out how much each friend will receive. Quick as a flash she says it is \$9999. She did this by imagining the prize was \$50,000. How did this help her work out the answer?

Estimation as a Check (Stage 6, Book 5, page 46)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can check any addition or subtraction problem I cannot solve mentally by estimating the answer.

- 1 Davida realises $45,578 - 23,666 = 19,012$ must be wrong. How does she know?

- 2 Doug buys a lawnmower, weed-trimmer and a garden rake. He is asked to pay \$1100.72. Without working the exact answer explain why this amount must be wrong.

Lawnmower	\$678.99
Weed-eater	\$189.75
Rake	\$31.98

- 3 Estimate these without writing down anything except the answers. Then write down your reasoning. (\approx is the sign that means "approximately equal to".)

$5709 - 3991 \approx$

Estimate the answer without writing down anything.

$\$7009.99 + \$994.87 \approx$

Now write down your reasoning.

Estimate these without writing down anything except the answers.

$9991.57 - 199 \approx$

$570.09 + 28.90 \approx$

$7003 - 3499 \approx$

$60.98 + 341.73 \approx$

$570.91 - 369.78 \approx$

$570.91 + 29.78 \approx$

$941 + 98 + 56 + 399 \approx$

$44,981 + 21 - 996 \approx$

$106,003 - 9994 + 1011 \approx$

$299,034 + 34,998 + 66,014 + 989.99 \approx$

- 4 Make up some addition and subtraction estimation problems of your own and then get a classmate to solve them.

Multiplication Smorgasbord

(Stage 7, Book 6, page 52)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

I can solve multiplication problems using a variety of a variety of mental strategies. I am practising this.

- 1 Marie worked out 58×5 by thinking $60 \times 5 = 300$, $2 \times 5 = 10$, and $300 - 10 = 290$. Use Marie's method to work these out.

$48 \times 5 = \square$

$4 \times 88 = \square$

$47 \times 3 = \square$

$9 \times 89 = \square$

$37 \times 4 = \square$

$9 \times 19 = \square$

$48 \times 3 = \square$

$5 \times 68 = \square$

$66 \times 5 = \square$

$4 \times 38 = \square$

- 2 Kate worked out 53×5 by thinking $50 \times 5 = 250$, $3 \times 5 = 15$, and $250 + 15 = 265$. Use Kate's method to work these out.

$42 \times 5 = \square$

$4 \times 84 = \square$

$93 \times 3 = \square$

$9 \times 81 = \square$

$35 \times 8 = \square$

$6 \times 23 = \square$

$83 \times 3 = \square$

$5 \times 64 = \square$

$64 \times 7 = \square$

$4 \times 33 = \square$

- 3 A mixture. Work these out.

$82 \times 5 = \square$

$4 \times 89 = \square$

$73 \times 3 = \square$

$9 \times 79 = \square$

$35 \times 8 = \square$

$6 \times 18 = \square$

$999 \times 8 = \square$

$2 \times 997 = \square$

$1002 \times 8 = \square$

$2 \times 2012 = \square$

4 Work these out.

$992 \times 5 = \square$

$4 \times 899 = \square$

$903 \times 3 = \square$

$9 \times 701 = \square$

$305 \times 8 = \square$

$6 \times 803 = \square$

$897 \times 3 = \square$

$5 \times 604 = \square$

$999 \times 7 = \square$

$3 \times 333 = \square$

5 Millie knows $4 \times 25 = 100$. So Millie works out 4×275 by thinking 4×300 is 1200, $4 \times 25 = 100$, $1200 - 100 = 1100$. Use Millie's method to work these out.

$575 \times 4 = \square$

$4 \times 825 = \square$

$925 \times 4 = \square$

$4 \times 775 = \square$

$125 \times 8 = \square$

$6 \times 825 = \square$

$825 \times 6 = \square$

$8 \times 625 = \square$

$925 \times 6 = \square$

$4 \times 350 = \square$

6 A challenge. Work these out.

$1025 \times 4 = \square$

$4 \times 3500 = \square$

$25 \times 16 = \square$

$80 \times 25 = \square$

$1250 \times 8 = \square$

$6 \times 1050 = \square$

$999 \times 6 = \square$

$9999 \times 9 = \square$

$999 \times 6 = \square$

$99,999 \times 7 = \square$

Cut and Paste (Stage 7, Book 6, page 49)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

- 1 Janice works out $5 \times 2,466,084$ by doubling 5 to 10 and halving 2,466,084 to 1,233,042 so the answer is 12,330,420.

Use Janice's method to fill in the boxes.

$5 \times 8,406,024 =$

$84 \times 5 =$

$5 \times 466,036 =$

$54 \times 5 =$

$8096 \times 5 =$

$5 \times 456 =$

$2.064 \times 5 =$

$5 \times 82 =$

$5 \times 0.0048 =$

$8.44 \times 5 =$

- 2 Fill in the boxes.

$50 \times 8844 =$

$84 \times 0.5 =$

$500 \times 46 =$

$54 \times 50 =$

$8.682 \times 500 =$

$0.5 \times 4680 =$

$4.2 \times 5000 =$

$50 \times 94 =$

$50 \times 0.68 =$

$6.22 \times 0.5 =$

- 3 Jerry notices the answers to $20 \div 5$ and $40 \div 10$ are the same. Circle True or false.

$40 \div 5 = 80 \div 10$ True/False

$36 \div 50 = 72 \div 100$ True/False

$88 \div 5 = 44 \div 10$ True/False

$4.8 \div 0.5 = 2.4 \div 1$ True/False

$0.06 \div 45 = 0.12 \div 90$ True/False

$12 \div 0.05 = 24 \div 0.1$ True/False

$1 \div 500 = 2 \div 1000$ True/False

$0.3 \div 0.04 = 0.06 \div 0.08$ True/False

Multiplication Smorgasbord - Algebra (Stage 7, Book 6, page 52)

Teachers: this work is for students who have successfully completed "Multiplication Smorgasbord - Using Number Properties", and have previously been taught the content of these sheets.

- 1 Kevin works out 6×95 by $6 \times 100 = 600$, $6 \times 5 = 30$, and $600 - 30 = 570$. So he knows $6 \times 95 = 6 \times 100 - 6 \times 5$ is a correct equation.

Put a tick or cross by each equation.

$$5 \times 896 = 5 \times 900 - 5 \times 4 \quad \boxed{}$$

$$7 \times 876 = 7 \times 900 - 7 \times 14 \quad \boxed{}$$

$$5 \times 311 = 5 \times 300 + 5 \times 11 \quad \boxed{}$$

$$5 \times 96 = 5 \times 100 - 20 \quad \boxed{}$$

$$311 \times 7 = 300 \times 7 + 11 \times 7 \quad \boxed{}$$

$$56 \times 38 = 56 \times 40 - 55 \times 2 \quad \boxed{}$$

$$991 \times 5 = 1000 \times 5 - 45 \quad \boxed{}$$

$$312 \times 5 = 300 \times 5 + 50 \quad \boxed{}$$

$$7 \times 886 = 900 \times 7 - 7 \times 14 \quad \boxed{}$$

$$876 \times 5 = 5 \times 900 - 14 \times 5 \quad \boxed{}$$

- 2 Put a tick or cross by each equation.

$$5 \times 800 - 6 \times 5 = 5 \times 794 \quad \boxed{}$$

$$3 \times 500 + 3 \times 16 = 3 \times 516 \quad \boxed{}$$

$$311 \times 7 - 7 \times 11 = 300 \times 7 \quad \boxed{}$$

$$8 \times 300 + 7 \times 16 = 8 \times 316 \quad \boxed{}$$

$$180 \times 11 - 80 \times 11 = 100 \times 11 \quad \boxed{}$$

$$5 \times 800 + 16 \times 5 = 5 \times 805 \quad \boxed{}$$

$$6 \times 67 = 6 \times (70 - 4) \quad \boxed{}$$

$$(23 - 7) \times 6 = 6 \times 23 - 7 \times 6 \quad \boxed{}$$

- 3 All the following contain an error. Rewrite them correctly in the boxes. (There may be more than one way of making the correction.)

$$214 \times 60 - 13 \times 60 = 200 \times 60$$

$$5 \times 800 + 5 \times 16 = 6 \times 816$$

$$12.6 \times 67 = 12.6 \times (70 - 1)$$

$$(23 - 7) \times 11 = 11 \times 23 - 6 \times 11$$

$$14 \times 40 - 40 \times 8 = 5 \times 40$$

$$0.3 \times 1.7 + 7.3 \times 0.3 = 0.3 \times 8$$

$$\frac{5}{6}\left(1 - \frac{1}{7}\right) = \frac{5}{6} - \frac{5}{36}$$

$$\left(\frac{5}{7} + \frac{1}{11}\right) \times 3 = \frac{15}{7} + \frac{4}{11}$$

- 4 Raewyn works out $9 \times 0.9 + 9 \times 99.1$ by $9 \times 100 = 900$. Use Raewyn's method to work out these answers.

$98 \times 67 + 2 \times 67 = \boxed{}$

$5 \times 0.87 + 5 \times 9.13 = \boxed{}$

$104 \times 0.43 - 4 \times 0.43 = \boxed{}$

$0.77 \times 86 + 0.77 \times 14 = \boxed{}$

$988 \times 9 - 88 \times 9 = \boxed{}$

$0.9 \times 0.87 + 0.1 \times 0.87 = \boxed{}$

$8 \times 0.66 - 2 \times 0.66 + 4 \times 0.66 = \boxed{}$

$3.11 \times 0.87 + 3.11 \times 9.13 = \boxed{}$

- 5 Fill in the boxes.

$5 \times 800 - 5 \times \boxed{} = 5 \times 784$

$98 \times 6 = 98 \times \boxed{} + 98 \times 4$

$3 \times \boxed{} - 3 \times 5 = 3 \times 795$

$5 \times 876 = 5 \times \boxed{} - 5 \times 14$

$\boxed{} \times 6 + 3 \times 6 = 13 \times 6$

$47 \times 0.78 = \boxed{} \times 0.78 - 3 \times 0.78$

- 6 Fill in the boxes to make a correct equation with number(s) of your choice.

$34 \times \boxed{} = 30 \times \boxed{} + 4 \times \boxed{}$

Repeat with different number(s).

$34 \times \boxed{} = 30 \times \boxed{} + 4 \times \boxed{}$

Repeat with more different number(s)

$34 \times \boxed{} = 30 \times \boxed{} + 4 \times \boxed{}$

7 Fill in the spaces. (Remember $67 \times z$ is written $67z$, and $p \times 34$ is written $34p$.)

$$35(x + 2) = \dots\dots\dots + 70$$

$$5(x + 7) = \dots\dots\dots + 35$$

$$11(r + 5) = \dots\dots\dots + 55$$

$$3(f + d) = \dots\dots\dots + 3d$$

$$9(y + x - 10) = \dots\dots\dots + \dots\dots\dots - \dots\dots\dots$$

$$7(q + x + j) = \dots\dots\dots + \dots\dots\dots + \dots\dots\dots$$

$$9(x - s) = \dots\dots\dots - \dots\dots\dots$$

$$30(6 - z) = \dots\dots\dots - \dots\dots\dots$$

8 Expand (write without brackets). Example: $5.1(10 + u) = 51 + 5.1u$.

$$5(x + 2) = \dots\dots\dots$$

$$6(h + 2) = \dots\dots\dots$$

$$10(6.3 - k) = \dots\dots\dots$$

$$100(0.5 - k) = \dots\dots\dots$$

$$7(z - 2) = \dots\dots\dots$$

$$3(z - 10) = \dots\dots\dots$$

$$(f + 20)i = \dots\dots\dots$$

$$(z - g - 6)n = \dots\dots\dots$$

$$e(f + 5) = \dots\dots\dots$$

$$n(g - 1) = \dots\dots\dots$$

$$(f - d)r = \dots\dots\dots$$

$$(a + b)r = \dots\dots\dots$$

$$c(3 - d) = \dots\dots\dots$$

$$r(10 + b - e) = \dots\dots\dots$$

9 Expand (write without brackets). Example: $3(10 + 3u) = 30 + 9u$.

$$2(5x + 1) = \dots\dots\dots$$

$$6(10h + 3) = \dots\dots\dots$$

$$100(6 - 2k) = \dots\dots\dots$$

$$3(1 - 20k) = \dots\dots\dots$$

$$3(5z - 7 + w) = \dots\dots\dots$$

$$6\left(\frac{1}{2}z - 10 + 2r\right) = \dots\dots\dots$$

$$(2d + 10)r = \dots\dots\dots$$

$$(g - 6)n = \dots\dots\dots$$

$$(f + 2w)r = \dots\dots\dots$$

$$(g - 6)n = \dots\dots\dots$$

$$e(f + 5) = \dots\dots\dots$$

$$n(g - 2q) = \dots\dots\dots$$

$$2r(f - d)r = \dots\dots\dots$$

$$2\gamma(a + b - c) = \dots\dots\dots$$

- 10 Factorise (write without brackets). Example: $50 + 10u = 10(5 + u)$.
- | | |
|------------------------|--------------------------|
| $3 + 6u =$ | $9 - 6u =$ |
| $600 - 2k =$ | $3 - 15k =$ |
| $4z - 6 =$ | $6z - 10 =$ |
| $dr + r =$ | $mg - 11m =$ |
| $fr + pfe =$ | $3g - 6nk =$ |
| $ef + 5e + ge =$ | $3gy + ng - 25g =$ |

- 11 Jerry factorises this way: $40 + 30u = 5(8 + 6u)$.
 Perminder factorises the same thing this way: $40 + 30u = 10(5 + 3u)$.
 The teacher says she prefers Perminder's answer. Explain why.

Most of these problems have more than one way to factorise them. Find the best way in each case.

- | | |
|---------------------------|---------------------------|
| $12 + 4u =$ | $36 - 9u =$ |
| $60 - 20k =$ | $45 - 15k =$ |
| $40z - 60 =$ | $18z - 24 =$ |
| $12dr + 6ar =$ | $mg - 11m =$ |
| $6fr + 3pf =$ | $3qd - 6qn =$ |
| $aef + 5ae =$ | $11yg - jyg =$ |
| $aef + 5ae + aer =$ | $5ng - jng + ngi =$ |

Cut and Paste (Stage 7, Book 6, page 49)

Teachers: this work is for students who have made the generalisations and do not need to use materials.

- 1 Janice works out $5 \times 2,466,084$ by doubling 5 to 10 and halving 2,466,084 to 1,233,043 so the answer is 12,330,430.

Use Janice's method to fill in the boxes.

$$5 \times 888,4642,004,682 = \boxed{}$$

$$8,404,622 \times 50 = \boxed{}$$

$$0.5 \times 0.444666888 = \boxed{}$$

$$54 \times 500 = \boxed{}$$

- 2 Jerry notices the answers to $20 \div 5$ and $40 \div 10$ have the same answer. Which are of these are true or false?

$$40 \div 5 = 80 \div 10 \quad \text{True/False} \qquad 36 \div 50 = 72 \div 100 \quad \text{True/False}$$

$$88 \div 5 = 44 \div 10 \quad \text{True/False} \qquad 4.8 \div 0.5 = 2.4 \div 1 \quad \text{True/False}$$

$$0.06 \div 45 = 0.12 \div 90 \quad \text{True/False} \qquad 12 \div 0.05 = 24 \div 0.01 \quad \text{True/False}$$

$$1 \div 500 = 2 \div 1000 \quad \text{True/False} \qquad 0.3 \div 0.04 = 0.06 \div 0.08 \quad \text{True/False}$$

- 4 Mandy works out $23 \div 5$ by realising $46 \div 10 = 4.6$. Use Mandy's method to work these out.

$$344 \div 5 = \boxed{}$$

$$54 \div 0.5 = \boxed{}$$

$$60 \div 0.5 = \boxed{}$$

$$74 \div 5 = \boxed{}$$

$$8,096 \div 5 = \boxed{}$$

$$446 \div 0.5 = \boxed{}$$

$$28 \div \frac{1}{2} = \boxed{}$$

$$0.4 \div \frac{1}{2} = \boxed{}$$

- 5 Sam knows facts like $2\frac{1}{4} \times 4 = 9$, $3\frac{1}{3} \times 3 = 10$, $2.5 \times 4 = 10$, $25 \times 4 = 100$, and $4 \times 0.25 = 1$. Use these facts to work out the answers in your mind.

$$2\frac{1}{4} \times 40 = \boxed{}$$

$$3\frac{1}{3} \times 12 = \boxed{}$$

$2.5 \times 0.5 =$

$25 \times 16 =$

$8 \times 2\frac{1}{4} =$

$27 \times 3\frac{1}{3} =$

$80 \times 0.25 =$

$0.25 \times 444 =$