

Lesson 9 – Multi-step Problems

**NC Objective:**  
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

**Resources needed:**  
Differentiated Worksheets  
Teaching Slides

**Vocabulary:**  
Add and subtract, multi-step problems, key vocabulary, operations

In this small step children will be using their knowledge of addition and subtraction to solve multi-step problems. The problems will appear in different contexts and in different forms i.e. bar models and word problems.

**Key Questions:**  
What is the key vocabulary in the question?  
What are the key bits of information?  
Can we put this information into a model?  
Which operations do we need to use?

★ Working Towards

★★ Working Within

★★★ Greater Depth

When Rosie opened her book, she saw two numbered pages. The sum of these two pages was 121. What would the next page number be?

Zach is thinking about two consecutive positive integer numbers. The sum of these two numbers is 529. What will the next number be?

The sum of two numbers is 13,650. The difference between these two numbers is 1,250. Use the bar model to help you find the numbers.

The sum of two numbers is 8,590. The difference between these two numbers is 7,580. Use the bar model to help you find the numbers.

The sum of two numbers is 12,100. The difference between these two numbers is 2,500. Use the bar model to help you find the numbers.

The sum of two numbers is 8,800. The difference between these two numbers is 6,200. Use the bar model to help you find the numbers.

When Rosie opened her book, she saw two numbered pages. The sum of these two pages was 794. What would the next page number be?

Zach is thinking about two consecutive positive integer numbers. The sum of these two numbers is 933. What will the next number be?

The sum of two numbers is 12,484. The difference between these two numbers is 1,356. Use the bar model to help you find the numbers.

The sum of two numbers is 11,712. The difference between these two numbers is 8,964. Use the bar model to help you find the numbers.

The sum of two numbers is 17,285. The difference between these two numbers is 3,721. Use the bar model to help you find the numbers.

The sum of two numbers is 23,458. The difference between these two numbers is 18,586. Use the bar model to help you find the numbers.

Rose adds numbers of three consecutive pages. The sum of these pages is 951. What would the next page number be?

Zach is thinking of two consecutive positive even numbers. The sum of these two numbers is 846. What will the next even number be?

Leanna is thinking of two consecutive positive odd numbers. The sum of these two numbers is 525. What will the next odd number be?

Melissa is thinking of three consecutive positive odd numbers. The sum of these three numbers is 1,605. What will the next odd number be?

The sum of three numbers is 3,855. Each next number is 12 more than previous one. Use the bar model to help you find the numbers.

The sum of three numbers is 17,400. Each next number is 152 more than previous one. Use the bar model to help you find the numbers.

Children on this sheet will find two consecutive numbers knowing their sum and find two numbers knowing their sum and difference. Numbers are multiples of 10.

Children on this sheet will find two consecutive numbers knowing their sum and find two numbers knowing their sum and difference.

Children on this sheet will find three consecutive odd or even numbers knowing their sum and find three numbers knowing their sum and differences.

Reasoning & Problem Solving

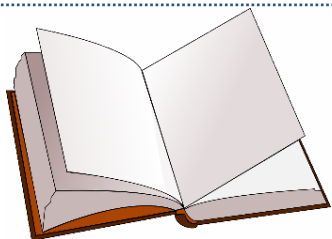
A milkman has 340 bottles of milk. He collects another 280 from the dairy, and delivers 485 during the day. How many does he have left?

On Monday, Rosie was paid £137. On Tuesday, she was paid £49 more than on Monday. On Wednesday, she was paid £49 less than on Monday. How much was Rosie paid in total? How many calculations did you do? Is there a more efficient method?

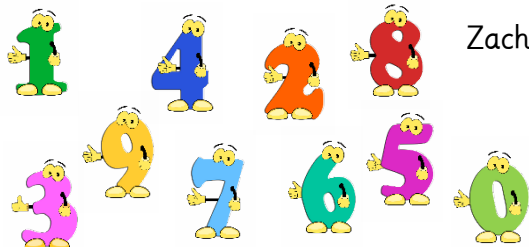
My method:  
485 - 340 = 145  
145 + 280 = 425

Do you agree with Leanna? Explain why.

Children continue working on solving multistep word problems by answering reasoning tasks.

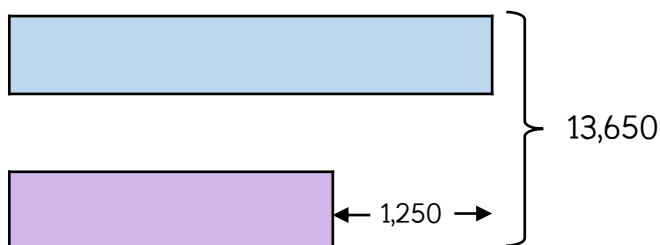


When Rosie opened her book, she saw two numbered pages.  
The sum of these two pages was 121.  
What would the next page number be?

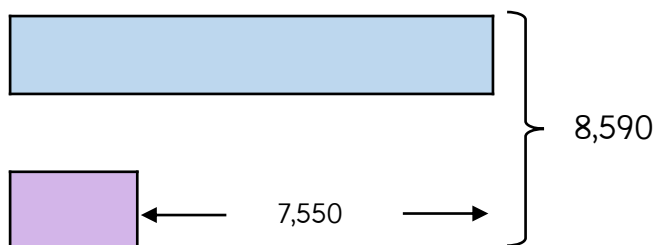


Zach is thinking about two consecutive positive integer numbers.  
The sum of these two numbers is 501.  
What will the next number be?

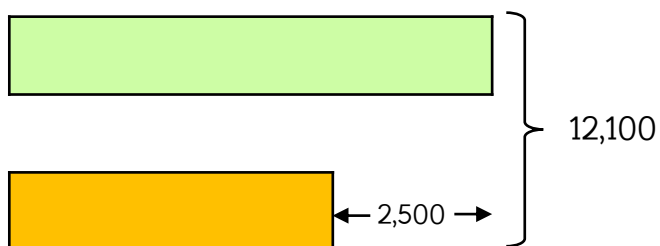
The sum of two numbers is 13,650.  
The difference between these two numbers  
is 1,250.  
Use the bar model to help you find the numbers.



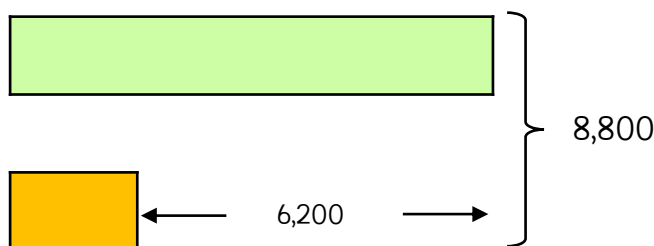

The sum of two numbers is 8,590.  
The difference between these two numbers  
is 7,550.  
Use the bar model to help you find the numbers.

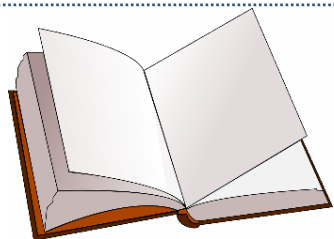



The sum of two numbers is 12,100.  
The difference between these two numbers  
is 2,500.  
Use the bar model to help you find the numbers.




The sum of two numbers is 8,800.  
The difference between these two numbers  
is 6,200.  
Use the bar model to help you find the numbers.





When Rosie opened her book, she saw two numbered pages.

The sum of these two pages was 121.

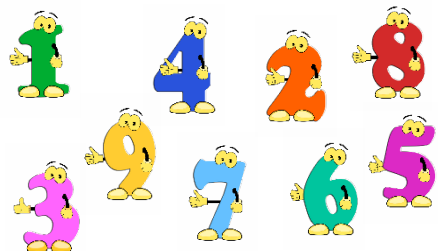
What would the next page number be?

$$121 - 1 = 120$$

$$120 \div 2 = 60$$

$$60 + 61 = 121$$

The next page number is 62



Zach is thinking about two consecutive positive integer numbers.

The sum of these two numbers is 501.

What will the next number be?

$$501 - 1 = 500$$

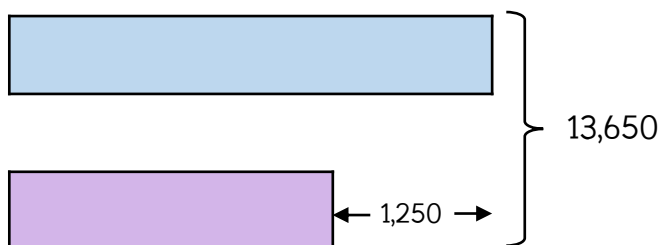
$$500 \div 2 = 250$$

$$250 + 251 = 501$$

The next number is 252

The sum of two numbers is 13,650.  
The difference between these two numbers  
is 1,250.

Use the bar model to help you find the numbers.



$$13,650 - 1,250 = 12,400$$

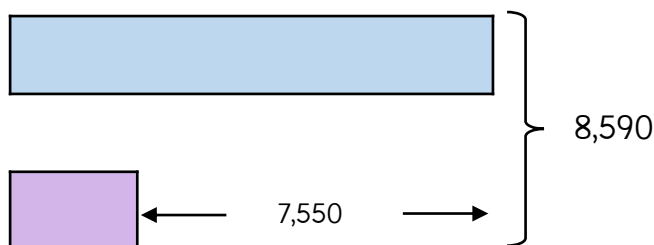
$$12,400 \div 2 = 6,200$$

$$6,200 + 1,250 = 7,450$$

6,200 and 7,450

The sum of two numbers is 8,590.  
The difference between these two numbers  
is 7,550.

Use the bar model to help you find the numbers.



$$8,590 - 7,550 = 1,040$$

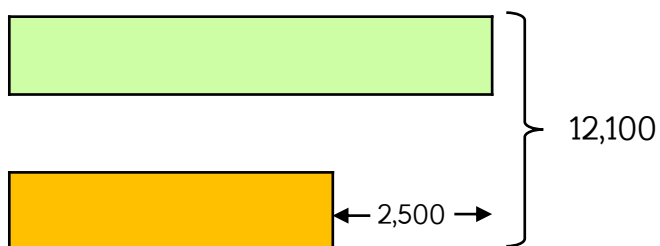
$$1,040 \div 2 = 520$$

$$520 + 7,550 = 8,070$$

520 and 8,070

The sum of two numbers is 12,100.  
The difference between these two numbers  
is 2,500.

Use the bar model to help you find the numbers.



$$12,100 - 2,500 = 9,600$$

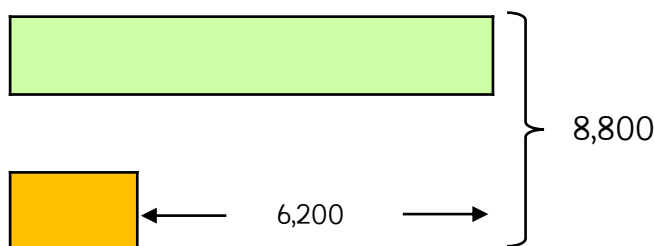
$$9,600 \div 2 = 4,800$$

$$4,800 + 2,500 = 7,300$$

4,800 and 7,300

The sum of two numbers is 8,800.  
The difference between these two numbers  
is 6,200.

Use the bar model to help you find the numbers.

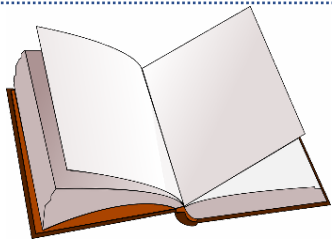


$$8,800 - 6,200 = 2,600$$

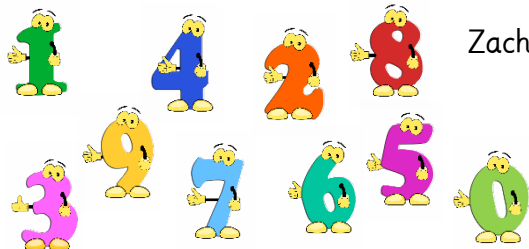
$$2,600 \div 2 = 1,300$$

$$1,300 + 6,200 = 7,500$$

1,300 and 7,500

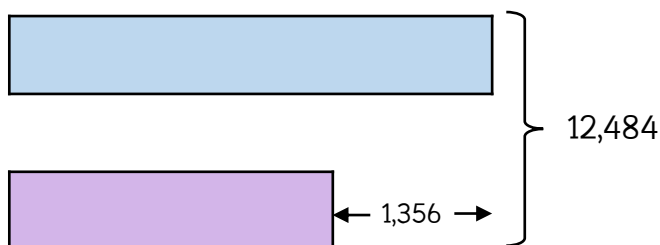


When Rosie opened her book, she saw two numbered pages.  
The sum of these two pages was 759.  
What would the next page number be?

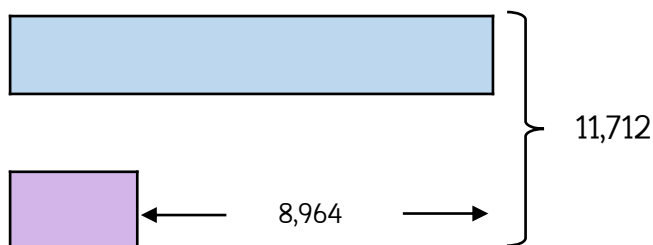


Zach is thinking about two consecutive positive integer numbers.  
The sum of these two numbers is 933.  
What will the next number be?

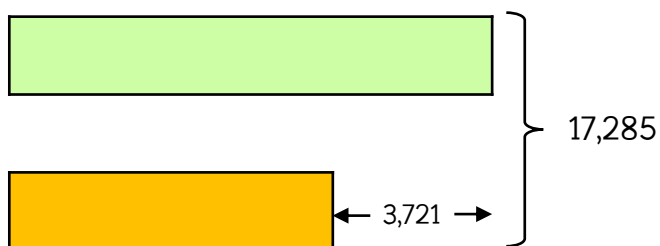
The sum of two numbers is 12,484.  
The difference between these two numbers  
is 1,356.  
Use the bar model to help you find the numbers.



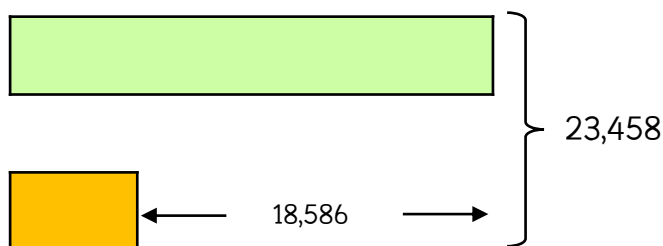

The sum of two numbers is 11,712.  
The difference between these two numbers  
is 8,964.  
Use the bar model to help you find the numbers.

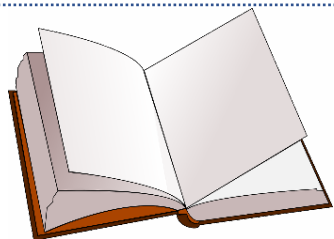



The sum of two numbers is 17,285.  
The difference between these two numbers  
is 3,721.  
Use the bar model to help you find the numbers.




The sum of two numbers is 23,458.  
The difference between these two numbers  
is 18,586.  
Use the bar model to help you find the numbers.

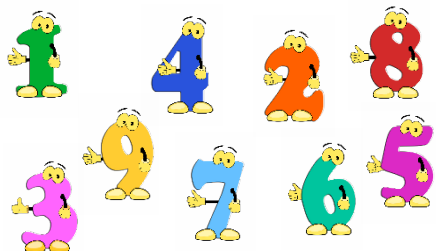




When Rosie opened her book, she saw two numbered pages.  
The sum of these two pages was 759.  
What would the next page number be?

$$\begin{aligned} 759 - 1 &= 758 \\ 758 \div 2 &= 379 \\ 379 + 380 &= 759 \end{aligned}$$

The next page number is 381

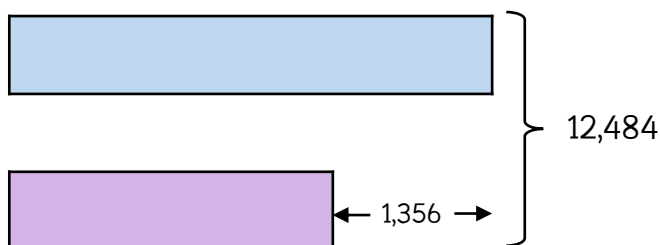


Zach is thinking about two consecutive positive integer numbers.  
The sum of these two numbers is 933.  
What will the next number be?

$$\begin{aligned} 933 - 1 &= 932 \\ 932 \div 2 &= 466 \\ 466 + 467 &= 933 \end{aligned}$$

The next number is 468

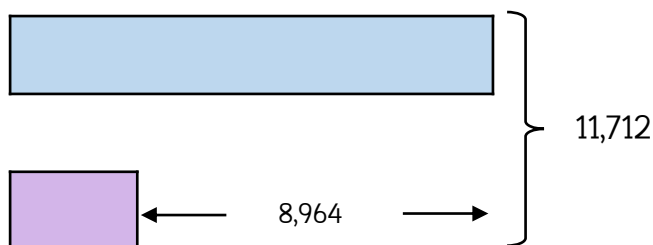
The sum of two numbers is 12,484.  
The difference between these two numbers  
is 1,356.  
Use the bar model to help you find the numbers.



$$\begin{aligned} 12,484 - 1,356 &= 11,128 \\ 11,128 \div 2 &= 5,564 \\ 5,564 + 1,356 &= 6,920 \end{aligned}$$

5,564 and 6,920

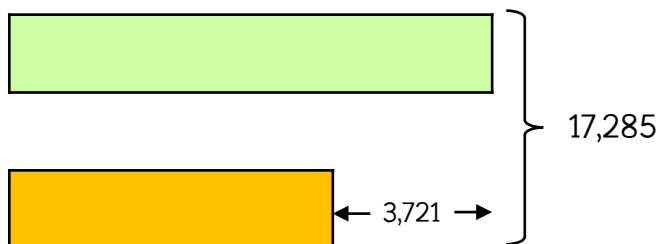
The sum of two numbers is 11,712.  
The difference between these two numbers  
is 8,964.  
Use the bar model to help you find the numbers.



$$\begin{aligned} 11,712 - 8,964 &= 2,748 \\ 2,748 \div 2 &= 1,374 \\ 1,374 + 8,964 &= 10,338 \end{aligned}$$

1,374 and 10,338

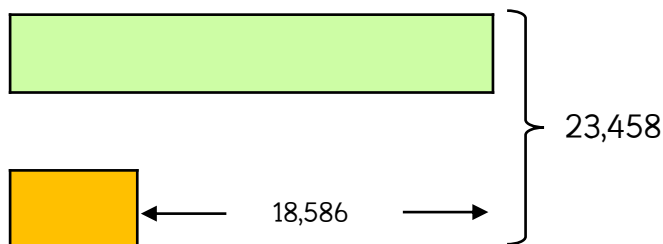
The sum of two numbers is 17,285.  
The difference between these two numbers  
is 3,721.  
Use the bar model to help you find the numbers.



$$\begin{aligned} 17,285 - 3,721 &= 13,564 \\ 13,564 \div 2 &= 6,782 \\ 6,782 + 3,721 &= 10,503 \end{aligned}$$

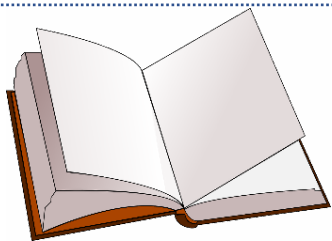
6,782 and 10,503

The sum of two numbers is 23,458.  
The difference between these two numbers  
is 18,586.  
Use the bar model to help you find the numbers.



$$\begin{aligned} 23,458 - 18,586 &= 4,872 \\ 4,872 \div 2 &= 2,436 \\ 2,436 + 18,586 &= 21,022 \end{aligned}$$

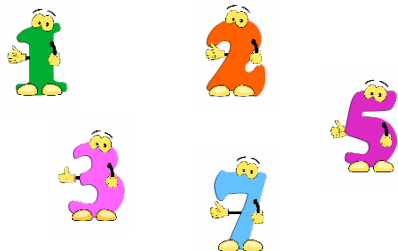
2,436 and 21,022



Rosie adds numbers of three consecutive pages.

The sum of these pages is 951.

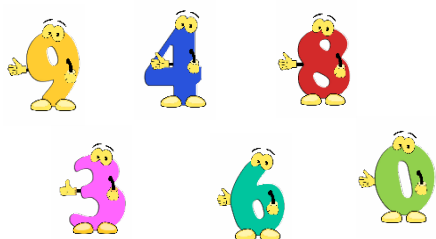
What would the next page number be?



Zach is thinking of two consecutive positive even numbers.

The sum of these two numbers is 846.

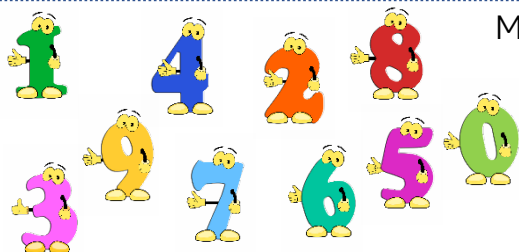
What will the next even number be?



Leanna is thinking of two consecutive positive odd numbers.

The sum of these two numbers is 928.

What will the next odd number be?

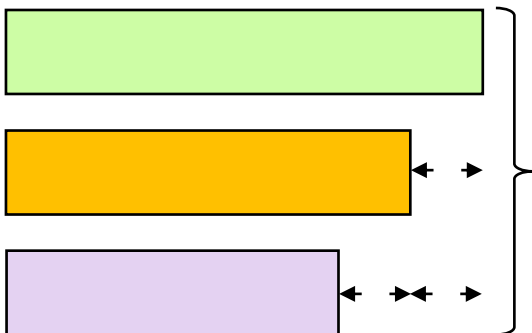


Malachi is thinking of three consecutive positive odd numbers.

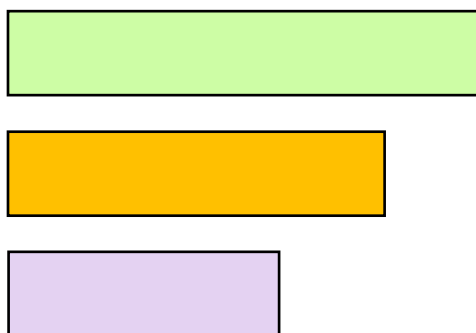
The sum of these three numbers is 1,605.

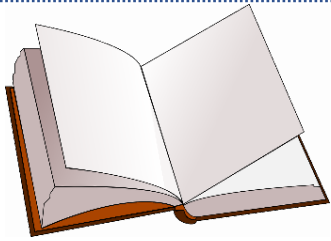
What will the next odd number be?

The sum of three numbers is 3,858.  
Each next number is 12 more than previous one.  
Use the bar model to help you find the numbers.




The sum of three numbers is 17,400.  
Each next number is 152 more than previous one.  
Use the bar model to help you find the numbers.





Rosie adds numbers of three consecutive pages.

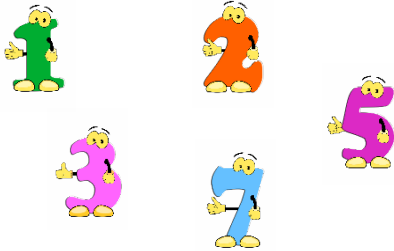
The sum of these pages is 951.

What would the next page number be?

$$951 \div 3 = 317$$

$$317 + 1 = 318$$

The next page number is 319



Zach is thinking of two consecutive positive even numbers.

The sum of these two numbers is 846.

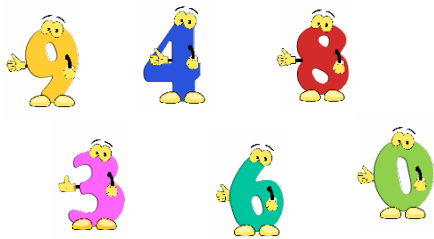
What will the next even number be?

$$846 - 2 = 844$$

$$844 \div 2 = 422$$

$$422 + 2 = 424$$

The next number is 426



Leanna is thinking of two consecutive positive odd numbers.

The sum of these two numbers is 928.

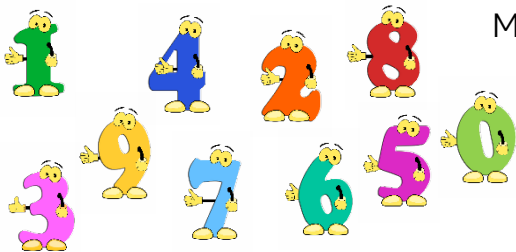
What will the next odd number be?

$$928 - 2 = 926$$

$$926 \div 2 = 463$$

$$463 + 2 = 465$$

The next number is 467



Malachi is thinking of three consecutive positive odd numbers.

The sum of these three numbers is 1,605.

What will the next odd number be?

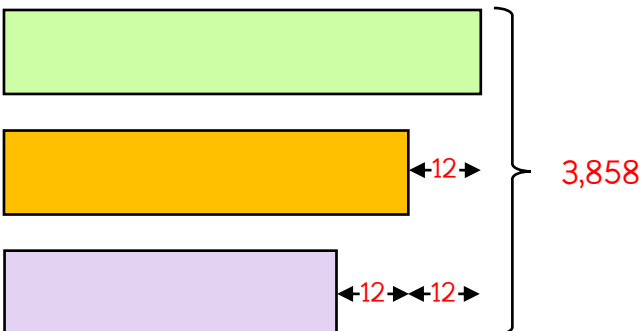
$$1,605 \div 3 = 535$$

$$535 - 2 = 533$$

$$535 + 2 = 537$$

The next number is 539

The sum of three numbers is 3,858.  
Each next number is 12 more than previous one.  
Use the bar model to help you find the numbers.



$$3,858 - 36 = 3,822$$

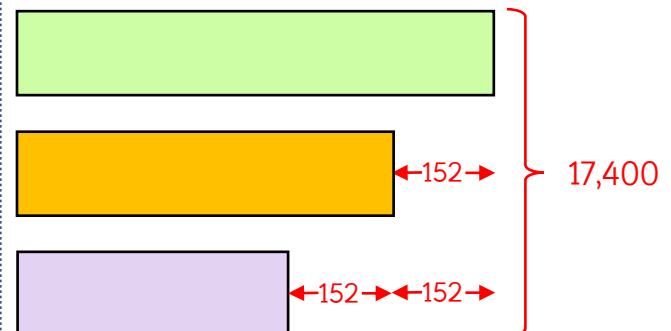
$$3,822 \div 3 = 1,274$$

$$1,274 + 12 = 1,286$$

$$1,286 + 12 = 1,298$$

1,274, 1,286 and 1,298

The sum of three numbers is 17,400.  
Each next number is 152 more than previous one.  
Use the bar model to help you find the numbers.



$$17,400 - 456 = 16,944$$

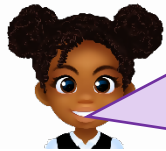
$$16,944 \div 3 = 5,648$$

$$5,648 + 152 = 5,800$$

$$5,800 + 152 = 5,952$$

5,648, 5,800 and 5,952

A milkman has 340 bottles of milk.  
He collects another 280 from the dairy,  
and delivers 485 during the day.  
How many does he have left?



Leanna

My method:

$$485 - 340 = 145$$

$$145 + 280 = 425$$

Do you agree with Leanna? Explain why.

On Monday, Rosie was paid £137.

On Tuesday, she was paid £49 more than  
on Monday.

On Wednesday, she was paid £49 less  
than on Monday.

How much was Rosie paid in total?  
How many calculations did you do?  
Is there a more efficient method?



A milkman has 340 bottles of milk.  
He collects another 280 from the dairy,  
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Leanna

My method:

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How much was Rosie paid in total?  
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A milkman has 340 bottles of milk. He collects another 280 from the dairy, and delivers 485 during the day. How many does he have left?



Leanna

My method:

$$485 - 340 = 145$$

$$145 + 280 = 425$$

Do you agree with Leanna? Explain why.

Leanna is wrong. She should have added 340 and 280, then subtracted 485 from the answer. There are 135 bottles of milk remaining.

On Monday, Rosie was paid £137.

On Tuesday, she was paid £49 more than on Monday.

On Wednesday, she was paid £49 less than on Monday.

How much was Rosie paid in total?  
How many calculations did you do?  
Is there a more efficient method?

£411.

Children might add 137 and 49, subtract 49 from 137 and then add their numbers.

A more efficient method is to recognise that the '£49 more' and '£49 less' cancel out so they can just multiply £137 by three.



A milkman has 340 bottles of milk. He collects another 280 from the dairy, and delivers 485 during the day. How many does he have left?



Leanna

My method:

$$485 - 340 = 145$$

$$145 + 280 = 425$$

Do you agree with Leanna? Explain why.

Leanna is wrong. She should have added 340 and 280, then subtracted 485 from the answer. There are 135 bottles of milk remaining.

On Monday, Rosie was paid £137.

On Tuesday, she was paid £49 more than on Monday.

On Wednesday, she was paid £49 less than on Monday.

How much was Rosie paid in total?  
How many calculations did you do?  
Is there a more efficient method?

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A more efficient method is to recognise that the '£49 more' and '£49 less' cancel out so they can just multiply £137 by three.

