2025 Maths Games Junior - Years 5 & 6
Resource Kit 2
Teaching Problem Solving

MATHS GAMES

Problem Solving Strategies

This resource kit focuses on the following problem solving strategies:

1. Work Backwards

If a problem describes a procedure and then specifies the final result, this method usually makes the problem much easier to solve.

2. Make an Organised List

Listing every possibility in an organised way is an important tool.

How students organise the data often reveals additional information.

It follows on from strategies introduced in the preparation resource kit and resource kit 1:

Guess, Check and Refine

Draw a Diagram

Find a Pattern

Build a Table

Resource Kit 2 focuses on:

Work Backwards

Make an Organised List

Set Yellow

Example problems for which full worked solutions are included.

Set Green

Problems that are designed to be similar to Set Yellow, but with fewer difficult elements.

Set Orange

Problems that are similar in mathematical structure to the corresponding Yellow problems.

Further questions and solution methods can be found in the APSMO resource book "Building Confidence in Maths Problem Solving", available from www.apsmo.edu.au.

How to use these problems

At the start of the lesson, present the problem and ask the students to think about it. Encourage students to try to solve it in any way they like. When the students have had enough time to consider their solutions, ask them to describe or present their methods, taking particular note of different ways of arriving at the same solution.

Each question includes at least one solution method that the majority of students should be able to follow. By participating in lessons that demonstrate achievable problem solving techniques, students may gain increased confidence in their own ability to address unfamiliar problems.

Finally, the consideration of different solution methods is fundamental to the students' development as effective and sophisticated problem solvers. Even when students have solved a problem to their own satisfaction, it is important to expose them to other methods and encourage them to judge whether or not the other methods are more efficient.

Preparation Kit

Guess, Check and Refine

This involves making a reasonable guess of the answer, and checking it against the conditions of the problem. An incorrect guess may provide more information that may lead to the answer.

Draw a Diagram

A diagram may reveal information that may not be obvious just by reading the problem.

It is also useful for keeping track of where the student is up to in a multi-step problem.

Resource Kit 1

Find a Pattern

A frequently used problem solving strategy is that of recognising and extending a pattern.

Students can often simplify a difficult problem by identifying a pattern in the problem situation.

Build a Table

A table displays information so that it is easily located and understood.

A table is an excellent way to record data so the student doesn't have to repeat their efforts.

Resource Kit 2

Work Backwards

If a problem describes a procedure and then specifies the final result, this method usually makes the problem much easier to solve.

Make an Organised List

Listing every possibility in an organised way is an important tool.

How students organise the data often reveals additional information.

Resource Kit 3

Solve a Simpler Related Problem

Many hard problems are actually simpler problems that have been extended to larger numbers.

Patterns can sometimes be identified by trying the problem with smaller numbers.

Eliminate All But One Possibility

Deciding what a quantity is not, can narrow the field to a very small number of possibilities.

These can then be tested against the conditions of the original problem.

Resource Kit 4

Convert to a More Convenient Form

There are times when changing some of the conditions of a problem makes a solution clearer or more convenient.

Divide a Complex Shape

Sometimes it is possible to divide an unusual shape into two or more common shapes that are easier to work with.

Set Yellow

2.1) Numbers such as 543 and 531 have their digits in decreasing order, because each digit is less than the digit to its left.

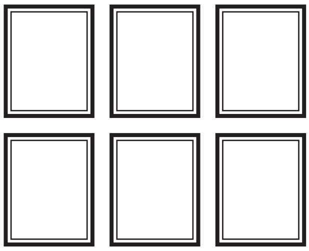
The digits in 322 are not in decreasing order.

How many whole numbers between 100 and 599 have their digits in decreasing order?

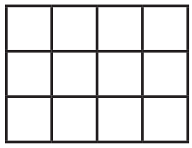
2.2) Emma paid $18 for the materials to make a set of six identical picture frames.

She sold each frame for the same price and made $24 in profit.

How much did she charge for each frame?



2.3) How many squares, of any size, can be traced on the lines in this diagram?

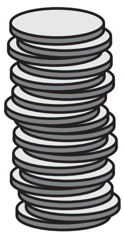


2.4) I arranged my 18 coins into 3 stacks.

The second stack has two coins more than the first stack.

The third stack has two coins more than the second stack.

How many coins are there in the second stack?



Maths Games Example Solution 2.1 - Yellow

Numbers such as 543 and 531 have their digits in decreasing order, because each digit is less than the digit to its left.

The digits in 322 are not in decreasing order.

How many whole numbers between 100 and 599 have their digits in decreasing order?

Strategy 1: Make an Organised List, and Find a Pattern

With a **1** in the hundreds place, the greatest tens digit would be **0**.

This is impossible, as the ones digit must be smaller than the tens digit.

So there are no such numbers with a hundreds digit of **1**.

There would, however, be **1** such number with a hundreds digit of **2**.

Hundreds	Tens	Ones
2	1	0

With a **3** in the hundreds place, the greatest tens digit would be **2**.

- With **2** in the tens place, there are **2** possible values for the ones place (**1** or **0**).
- With **1** in the tens place, there is **1** possible value for the ones place (**0**).

There are **2** + **1** = **3** numbers for which this works.

Hundreds	Tens	Ones
3	2	1
3	2	0
3	1	0

So far, we have found that:

- There is **1** such number with a hundreds digit of **2**;
- There are **2** + **1** = **3** such numbers with a hundreds digit of **3**.

If the pattern continues, then we might expect:

- **3** + **2** + **1** = **6** numbers with a hundreds digit of **4**;
- **4** + **3** + **2** + **1** = **10** numbers with a hundreds digit of **5**.

We can see that this is the case by listing all of the values in an organised way.

Therefore there are **1** + **3** + **6** + **10** = **20** whole numbers between **100** and **599** which have their digits in decreasing order.

Hundreds	Tens	Ones
4	3	2
4	3	1
4	3	0
4	2	1
4	2	0
4	1	0

Hundreds	Tens	Ones
5	4	3
5	4	2
5	4	1
5	4	0
5	3	2
5	3	1
5	3	0
5	2	1
5	2	0
5	1	0

Strategy 2: Make an Organised List, and Find a Pattern (2)

Since we are looking for numbers with digits in decreasing order, let's begin with **599** and work back to **100**.

The greatest possible value is **543**, followed by other values in the 540s:	543	542	541	540
then the 530s:		532	531	530
520s:			521	520
and 510s:				510
Next, we would have **432**, followed by other values in the 430s:		432	431	430
then the 420s:			421	420
and 410s:				410
Next, we would have **321**, followed by other values in the 320s:			321	320
and 310s:				310
Finally, we would have 210.				210

There are **10** + **6** + **3** + **1** = **20** 3-digit numbers less than or equal to **599**, that have digits in decreasing order.

Answer **20**

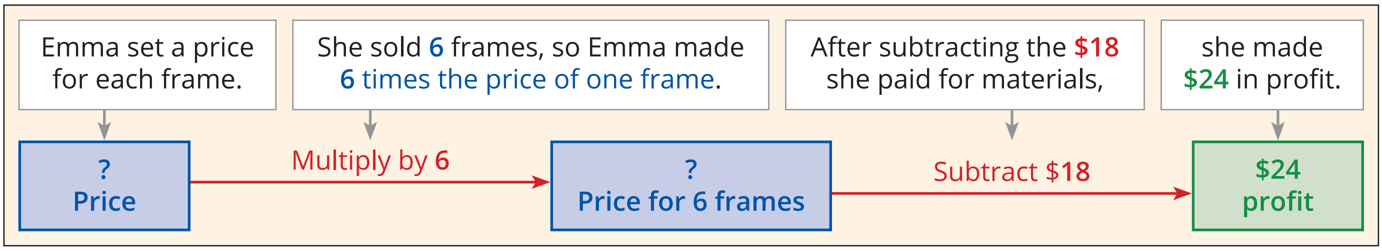
Maths Games Example Solution 2.2 - Yellow

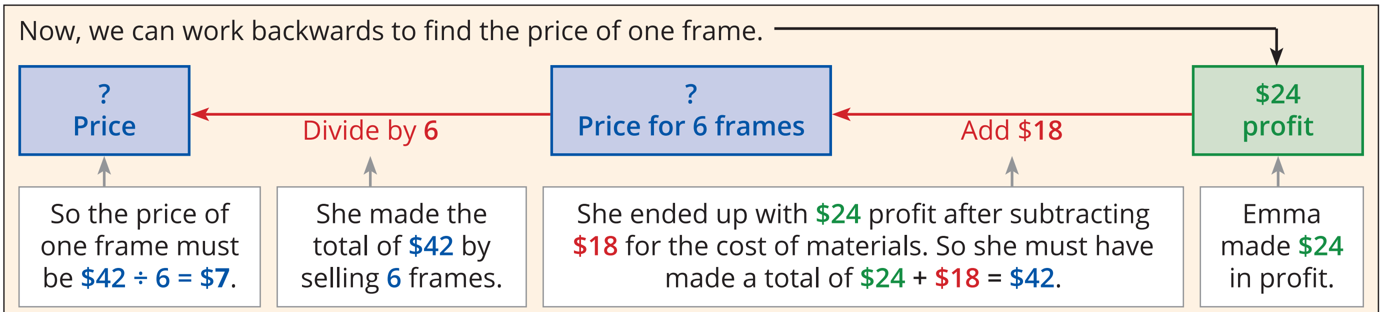
Emma paid $18 for the materials to make a set of six identical picture frames.

She sold each frame for the same price and made $24 in profit.

How much did she charge for each frame?

Strategy 1: Work Backwards





Emma must have charged **$7** for each picture frame.

Strategy 2: Find the Cost and Profit for One Frame

Emma paid $18 for all the materials, which is $18 ÷ 6 = $3 for the materials for each frame.

She made $24 in profit, which is $24 ÷ 6 = $4 profit for each frame.

Having paid $3 for materials, in order to make $4 profit, Emma must have sold each frame for $3 + $4 = $7.

Strategy 3: Guess, Check and Refine

Let's guess that Emma charged $10 for each frame.

After selling all six frames for 6 × $10 = $60, she would have made a profit of $60 – $18 = $42.

That's more than the profit Emma actually made.

Price of 1 frame	$10			
Price of 6 frames	$60			
Profit	$42			

Let's guess that Emma charged $5 for each frame.

After selling all six frames for 6 × $5 = $30, she would have made a profit of $30 – $18 = $12.

That's less than the profit Emma actually made.

Price of 1 frame	$10	$5		
Price of 6 frames	$60	$30		
Profit	$42	$12		

Let's guess that Emma charged $7 for each frame.

After selling all six frames for 6 × $7 = $42, she would have made a profit of $42 – $18 = $24.

That matches the question.

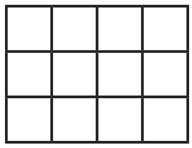
Price of 1 frame	$10	$5	$7	
Price of 6 frames	$60	$30	$42	
Profit	$42	$12	$24	

Emma must have charged **$7** for each picture frame.

Answer $7

Maths Games Example Solution 2.3 - Yellow

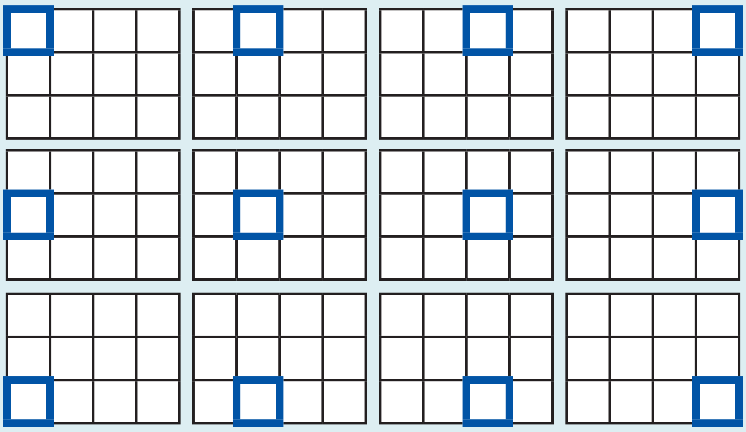
How many squares, of any size, can be traced on the lines in this diagram?



Strategy 1: Make an Organised List

We'll start with squares that have side length 1.

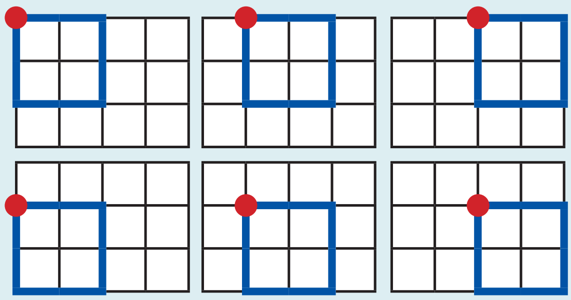
There are 12 of these squares, as shown.



To find squares with side length 2, we'll start by placing the top left of a square on the top left point of the diagram, and then move along the top row.

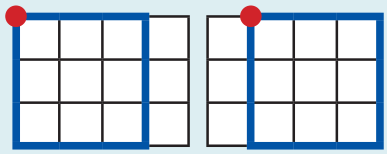
The same process happens with the next row.

There are 6 squares with side length 2.



We can repeat this process to find squares with side length 3.

There are 2 squares with side length 3.



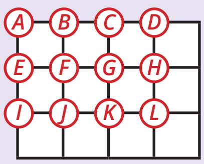
There are no squares with side lengths greater than 3.

There are 12 + 6 + 2 = **20** squares in this diagram.

Strategy 2: Make an Organised List (Alternative Method)

We can count the squares by considering one intersection at a time.

Let's label each intersection point to make it easier to talk about them.



We shall consider a point if it is possible for it to be the top left corner of a square.

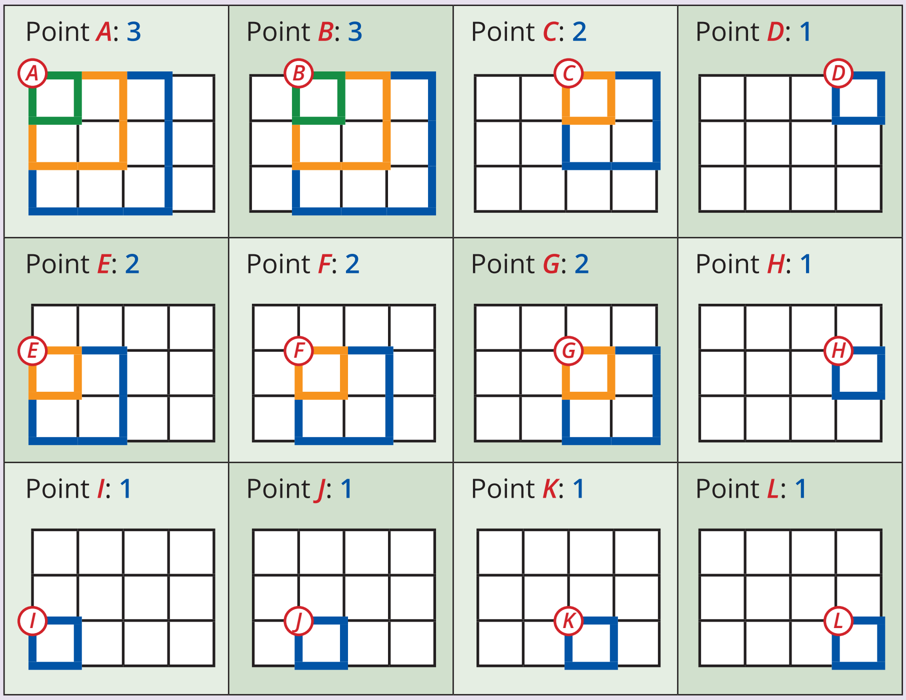
Since we have created the list in an organised way, we can be sure that we have included every possible square.

There are

(3+3+2+1)+(2+2+2+1)+(1+1+1+1)

= 9 + 7 + 4

= **20** squares in this diagram.



Answer **20**

Maths Games Example Solution 2.4 - Yellow

I arranged my 18 coins into 3 stacks.

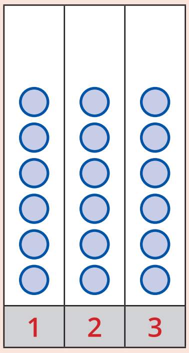
The second stack has two coins more than the first stack.

The third stack has two coins more than the second stack.

How many coins are there in the second stack?

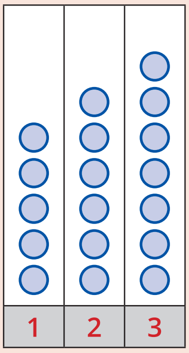
Strategy 1: Work Backwards

Let's begin by distributing the **18** coins evenly on the three stacks, so that there will be **6** coins on each stack.



The first stack is supposed to be the shortest.

Let's take a coin off Stack **1** and give it to Stack **3**, which is meant to be the tallest.



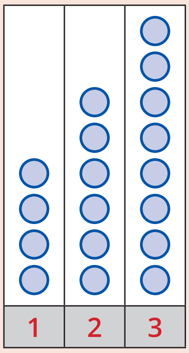
With this arrangement,

- Stack **2** has one coin more than Stack **1**.
- Stack **3** has one coin more than Stack **2**.

We want Stack **2** to have two coins more than Stack **1**, and Stack **3** to have two coins more than Stack **2**.

Let's repeat the process.

We'll take one more coin off Stack **1**, and give it to Stack **3**.



With this arrangement,

- Stack **2** has two coins more than Stack **1**.
- Stack **3** has two coins more than Stack **2**.

That matches the question.

We can see that there are **6** coins in the second stack.

Strategy 2: Build a Table, and Find a Pattern

Let's start with just 1 coin in the first stack.

There would then be 1 + 2 = 3 coins in the second stack, and 3 + 2 = 5 coins in the third stack, for a total of 1 + 3 + 5 = 9 coins.

1st Stack	2nd Stack	3rd Stack	Total Coins
1	3	5	1 + 3 + 5 = 9

If there were 2 coins in the first stack, there would be 4 in the second and 6 in the third, for a total of 2 + 4 + 6 = 12 coins.

1st Stack	2nd Stack	3rd Stack	Total Coins
2	4	6	2 + 4 + 6 = 12

Each time we increase the number of coins in the first stack by 1, the total number of coins seems to increase by 3.

Why does this happen?

1st Stack	2nd Stack	3rd Stack	Total Coins
3	5	7	3 + 5 + 7 = 15

Following the pattern, we can see that having 4 coins in the first stack would result in a total of 4 + 6 + 8 = 18 coins.

This matches the question.

There are **6** coins in the second stack.

1st Stack	2nd Stack	3rd Stack	Total Coins
4	6	8	4 + 6 + 8 = 18

Answer 6

Set Green

2.1) Numbers such as 43 and 31 have their digits in decreasing order, because the ones digit is less than the tens digit.

The digits in 22 are not in decreasing order.

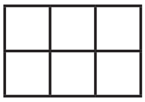
How many whole numbers between 10 and 59 inclusive have their digits in decreasing order?

2.2) Emma paid $10 for the materials to make two identical picture frames.

She sold each frame for the same price and made $4 in profit.

How much did she charge for each frame?

2.3) How many squares, of any size, can be traced on the lines in this diagram?



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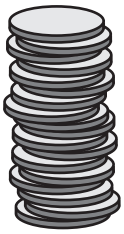
The third stack has one coin more than the second stack.

How many coins are there in the second stack?



Preparation Task 1

In the addition shown, different letters represent different digits.

What is the four-digit number represented by *ABCD*?

				8	*A*
			2	*B*	9
		1	*C*	6	7
+	1	*D*	7	5	4
	1	2	3	4	5

A) Nafiz, Aliyah and Jack are working on this problem.

Nafiz says,

"*A* + 9 + 7 + 4 must be at least 20."

Aliyah says,

"Yes I agree - and *A* + 9 + 7 + 4 must be less than 30."

Explain how Nafiz and Aliyah were able to make these statements.

B) Jack says,

"Okay, so we know that *A* + 9 + 7 + 4 = 25.

We'll need to carry the 2 from the ones column to the tens column."

Write a number sentence for the tens column, and use it to find *B*.

C) Aliyah says,

"I got 5320, but I think we should check."

Is Aliyah right? Show how you might check her answer.

Maths Games Example Solution - Preparation Task 1

In the addition shown, different letters represent different digits.

What is the four-digit number represented by *ABCD*?

$$\begin{array}{r} 8\,A \\ 2\,B\,9 \\ 1\,C\,6\,7 \\ +\;1\,D\,7\,5\,4 \\ \hline 1\,2\,3\,4\,5 \end{array}$$

Strategy 1: Work Backwards

Working from the ones column, $A + 9 + 7 + 4$ must be a number that ends in **5**.

$A + 9 + 7 + 4 = A + 20$.

Since $A + 20$ ends in **5**, and Since A is a one-digit number, $A + 20 = 25$ and $A = 5$.

We'll carry the **2** from **25** to the tens column.

$$\begin{array}{r} {}^{2} \\ 8\,A \\ 2\,B\,9 \\ 1\,C\,6\,7 \\ +\;1\,D\,7\,5\,4 \\ \hline 1\,2\,3\,4\,5 \end{array}$$

In the tens column, $2 + 8 + B + 6 + 5$ must be a number that ends in **4**.

$2 + 8 + B + 6 + 5 = B + 21$.

Since $B + 21$ ends in **4**, and Since B is a one-digit number, $B + 21 = 24$ and $B = 3$.

We'll carry the **2** from **24** to the hundreds column.

$$\begin{array}{r} {}^{2} \\ 8\,5 \\ 2\,B\,9 \\ 1\,C\,6\,7 \\ +\;1\,D\,7\,5\,4 \\ \hline 1\,2\,3\,4\,5 \end{array}$$

In the hundreds column, $2 + 2 + C + 7$ must be a number that ends in **3**.

$2 + 2 + C + 7 = C + 11$.

Since $C + 11$ ends in **3**, and Since C is a one-digit number, $C + 11 = 13$ and $C = 2$.

We'll carry the **1** from **13** to the thousands column.

$$\begin{array}{r} {}^{2} \\ {}^{2}\;8\,5 \\ 2\,3\,9 \\ 1\,C\,6\,7 \\ +\;1\,D\,7\,5\,4 \\ \hline 1\,2\,3\,4\,5 \end{array}$$

In the thousands column, $1 + 1 + D$ must be a number that ends in **2**.

$1 + 1 + D = D + 2$.

Since $D + 2$ ends in **2**, and Since D is a one-digit number, $D + 2 = 2$ and $D = 0$.

There's nothing to carry to the ten thousand column.

$$\begin{array}{r} {}^{2} \\ {}^{2}\;8\,5 \\ {}^{1}\;2\,3\,9 \\ 1\,2\,6\,7 \\ +\;1\,D\,7\,5\,4 \\ \hline 1\,2\,3\,4\,5 \end{array}$$

If $A = 5$, $B = 3$, $C = 2$ and $D = 0$, then the four-digit number ***ABCD*** is **5320**.

Strategy 2: Think Flexibly about Numbers

In this question, *A*, *B*, *C* and *D* represent different digits.

The number $8A = 80 + A$,

$2B9 = 209 + B0$,

$1C67 = 1067 + C00$,

and $1D754 = 10754 + D000$.

We can therefore rewrite the sum as

$80 + A + 209 + B0 + 1067 + C00 + 10754 + D000 = 12345$

which rearranges to become

$80 + 209 + 1067 + 10754 + A + B0 + C00 + D000 = 12345$.

$$\begin{array}{r} {}^{2} \\ {}^{2}\;8\,0 \\ {}^{1}\;2\,0\,9 \\ 1\,0\,6\,7 \\ +\;1\,0\,7\,5\,4 \\ \hline 1\,2\,1\,1\,0 \end{array}$$

Having worked out that

$80 + 209 + 1067 + 10754 = 12110$

and $A + B0 + C00 + D000 = DCBA$,

we have $DCBA + 12110 = 12345$.

$DCBA = 12345 - 12110$.

$$\begin{array}{r} 1\,2\,3\,4\,5 \\ -\;1\,2\,1\,1\,0 \\ \hline 2\,3\,5 \end{array}$$

We can see that *DCBA* = (0)235.

Therefore:

$A = 5$,

$B = 3$,

$C = 2$,

$D = 0$,

and so *ABCD* must represent **5320**.

Answer 5320

Preparation Task 2

A) Adam was working on this problem.
Part of his working is shown below.
Can you complete the working?

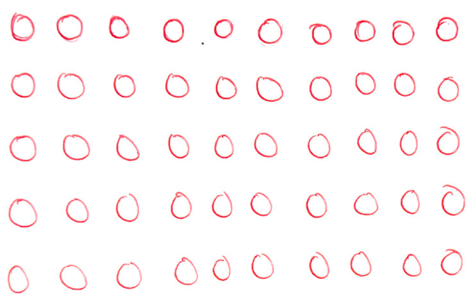
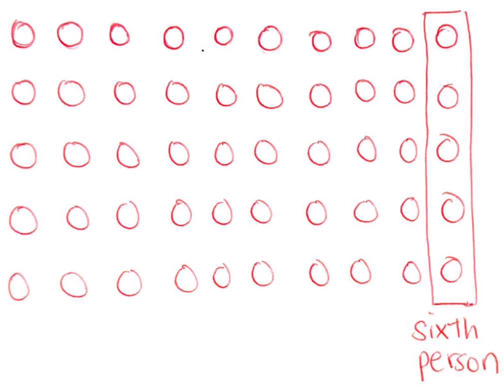
> Five friends have picked some apples. If they share their apples equally, they would have 10 each.
>
> A sixth person arrived with some more apples.
>
> When they shared all of the apples equally amongst the six of them, they all ended up with 9 apples each.
>
> How many apples did the sixth person bring?

Total no. of apples for 5 friends if they get 10 each after sharing equally:

Total no. of apples for 6 people if they get 9 each after sharing equally:

What did the 6th person bring?

B) When Tianna and Lucy worked on this problem, they drew a diagram.

This is their original diagram:	A few minutes later, the diagram looked like this:
	

Adam came by and said, "I don't get it. Why do you have a box labelled 'sixth person' ? "

Explain how Tianna and Lucy solved the problem.

Maths Games Example Solution - Preparation Task 2

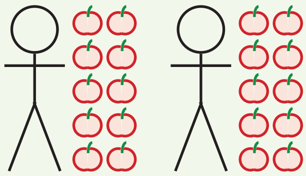
Five friends have picked some apples. If they share their apples equally, they would have 10 each.

A sixth person arrived with some more apples.

When they shared all of the apples equally amongst the six of them, they all ended up with 9 apples each.

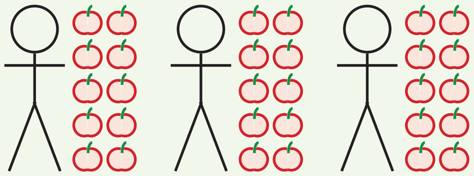
How many apples did the sixth person bring?

Strategy: Draw a Diagram, and Work Backwards

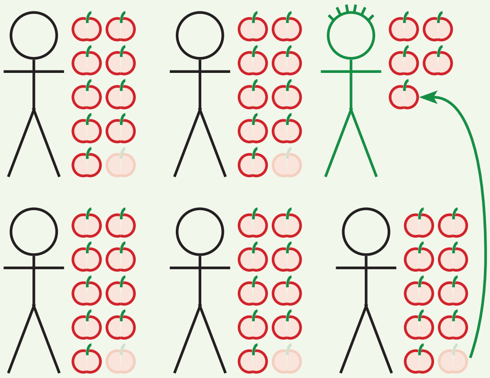


Five friends have picked some apples.

If they share their apples equally, they would have **10** each.

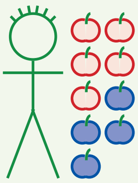


So, at this point, there are **5** × **10** = **50** apples.



After the sixth person comes, everyone ends up with **9** apples.

It is as though each of the original **5** people gives **1** apple to the sixth person.



After giving one apple away to the sixth person, each of the original **5** people has **9** apples.

The sixth person has those **5** apples that were given to him, plus whatever he brought with him when he first arrived.

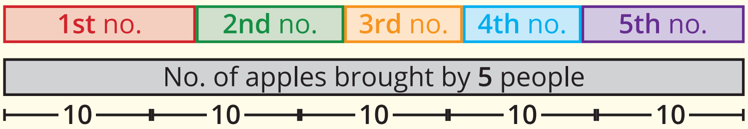
We know that he, too, ended up with **9** apples.

Therefore the sixth person must have brought **9 – 5 = 4** apples.

Strategy: Draw a Diagram, and Work Backwards (Alternative Method)

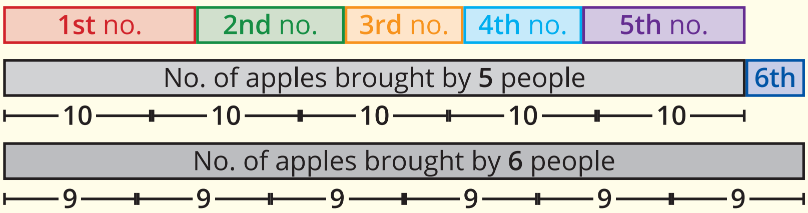
We begin with apples brought by **5** people.

If they share them equally, each person would have **10** apples.



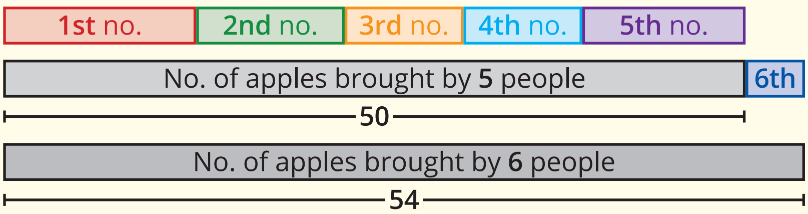
A sixth number is added to the sum of the original **5** numbers.

This sum divided by **6** is **9**.



From the diagram, we can see that:

- The sum of the **5** numbers is **5** × **10** = **50**.
- The sum of the **6** numbers is **6** × **9** = **54**.
- The **6th** number is the difference between these two sums.



Therefore the **6th** number is **54 – 50 = 4**.

Answer 4

Preparation Task 3

> **There are four students who play drums in the school band.**
>
> **Since the school only has two drum kits, different pairs of students are chosen to play in each band performance.**
>
> **How many different pairs of drummers are possible?**

A) Eddie, Daisy and Ginny are working on this problem.

Eddie says, "Let's begin by calling the drummers *A*, *B*, *C*, and *D*.

Then, we can figure out pairs of drummers if we choose *A* first."

Write an organised list of pairs of drummers, where *A* got chosen first.

B) Daisy says, "We can also list the pairs where *B* was chosen first - and *C* first, and *D* first."

Write organised lists of pairs of drummers, with:

• *B* chosen first:	• *C* chosen first:	• *D* chosen first:

Daisy looks at the lists and says, "I think we have double counted."

Explain what Daisy means by this.

C) Ginny says,

"We can also use a table to figure this out."

Fill in Ginny's table by first crossing out any impossible pair combinations, and only writing letters in alphabetical order to avoid double counting.

	A	*B*	*C*	*D*
A				
B				
C				
D				

D) How many different pairs of drummers are possible if a new drummer joins the group?

Choose either method to solve this problem.

Maths Games Example Solution - Preparation Task 3

There are four students who play drums in the school band.

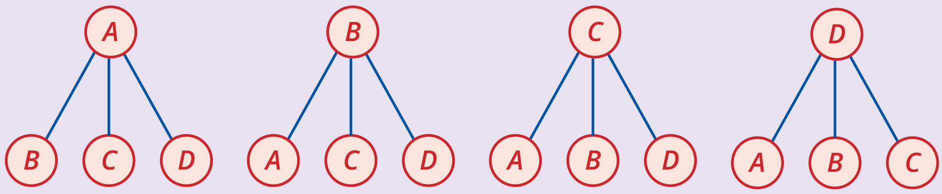
Since the school only has two drum kits, different pairs of students are chosen to play in each band performance.

How many different pairs of drummers are possible?

Strategy 1: Make an Organised List

Let's call our four drummers *A*, *B*, *C* and *D*.

After determining the first drummer, there are three options remaining for the second drummer.

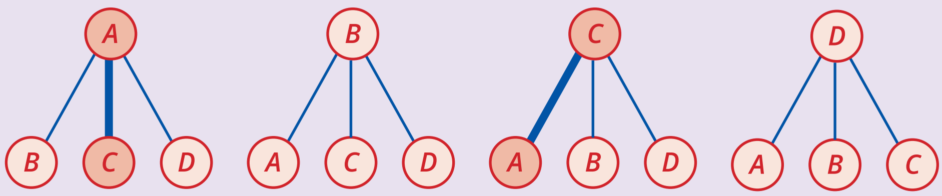


We can see that there are **12** ways to form pairs.

However, this method actually double-counts each pair.

For example, we could select *A* first and *C* second; or we could select *C* first and *A* second.

Either way, we would have chosen both *A* and *C* to play in the performance.



There are **12 ÷ 2 = 6** different pairs of drummers.

Strategy 2: Build a Table

Let's start by listing the first drummer in the pair.

A
B
C
D

The second drummer would also be one of *A*, *B*, *C* or *D*.

	A	*B*	*C*	*D*
A				
B				
C				
D				

We'll eliminate "pairs" that have two of the same drummer.

	A	*B*	*C*	*D*
A	✗			
B		✗		
C			✗	
D				✗

To avoid double-counting, we'll only include pairs where the drummers' names are in alphabetical order.

	A	*B*	*C*	*D*
A	✗	✓	✓	✓
B		✗	✓	✓
C			✗	✓
D				✗

We can see that there are **6** different pairs of drummers.

Answer 6

Preparation Task 4

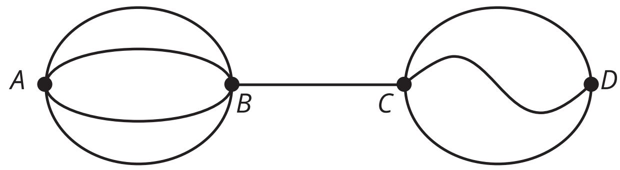
A) Juliano and Wendy were working on this problem.

Juliano began by using his pencil to trace every path, counting as he went.

Try this method. How many paths did you count?

Following only the paths shown, what is the number of different paths that go from A to B to C to D?

You must touch each of those points exactly once.



B) Wendy labelled every path with a different letter, starting with *e*, *f*, *g*, and so on.

She then used these labels to write an organised list.

Write Wendy's list. How many paths are there?

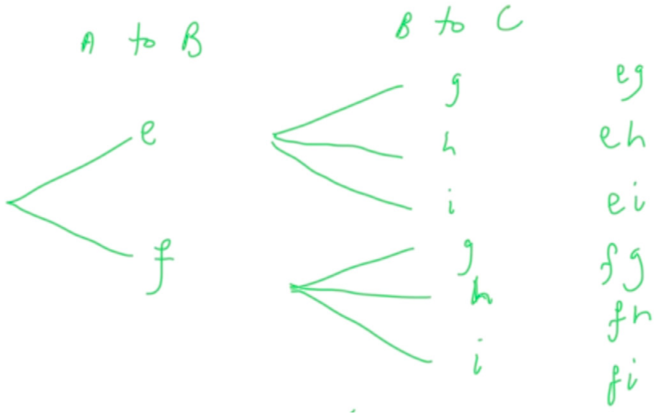
C) Juliano looked at Wendy's list and said,

"If we make up an easier map, maybe we'll be able to see a pattern."

They tried their idea on a new map with 2 paths, followed by 3 paths.

The diagram on the right is what Wendy drew to justify their answer.

Wendy said, "If there are 2 paths then 3 paths, there are a total of 6 paths."



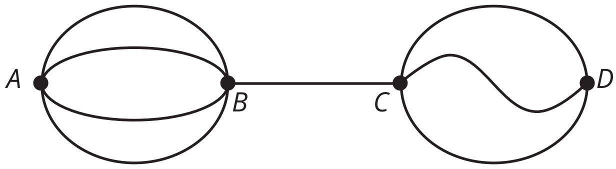
Use a similar logic to complete the original question.

If there are 4 paths, then 1 path, then 3 paths:

Maths Games Example Solution - Preparation Task 4

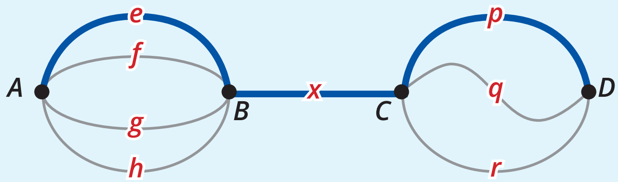
Following only the paths shown, what is the number of different paths that go from *A* to *B* to *C* to *D*?

You must touch each of those points exactly once.

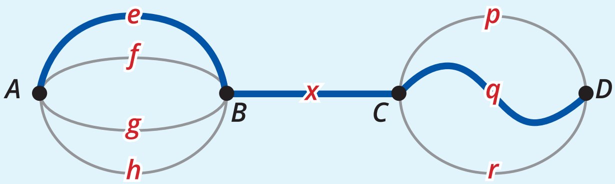


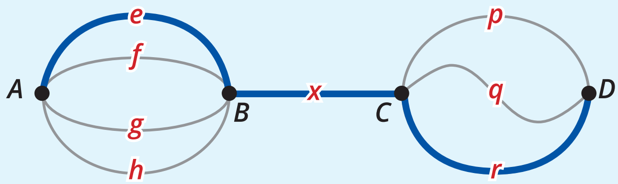
Strategy 1: Make an Organised List

Let's label all of the paths.
We can then try out one path and see how it goes.
The topmost path from ***A*** to ***B*** is ***e***.
From ***B*** to ***C***, there is only one path, ***x***.
From ***C*** to ***D***, the topmost path is ***p***.
So, we can go from ***A*** to ***B*** to ***C*** to ***D*** along paths ***e***, ***x***, ***p***.



What if we follow the same path to ***C***, and then just change the last path?
If we do that, we can go from ***A*** to ***B*** to ***C*** to ***D*** along paths ***e***, ***x***, ***q***, and ***e***, ***x***, ***r***.





Let's make a list.

We will start with the paths ***e***, ***x***, something.

A → *B*	*B* → *C*	*C* → *D*
e ,	*x* ,	*p*
e ,	*x* ,	*q*
e ,	*x* ,	*r*

There is only one option for the ***B*** → ***C*** path.

Let's try the next ***A*** → ***B*** path.

A → *B*	*B* → *C*	*C* → *D*
f ,	*x* ,	*p*
f ,	*x* ,	*q*
f ,	*x* ,	*r*

We can also travel from ***A*** → ***B*** along path ***g***,

A → *B*	*B* → *C*	*C* → *D*
g ,	*x* ,	*p*
g ,	*x* ,	*q*
g ,	*x* ,	*r*

and along path ***h***.

A → *B*	*B* → *C*	*C* → *D*
h ,	*x* ,	*p*
h ,	*x* ,	*q*
h ,	*x* ,	*r*

That's all of the possible paths.

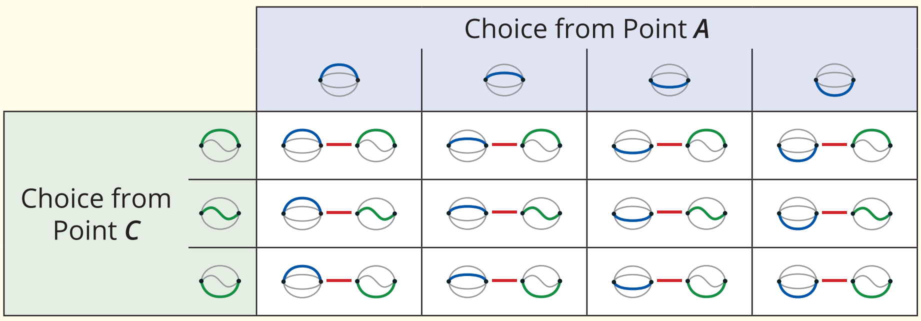
In total, there are **4** × **3** = **12** different paths that go from *A* to *B* to *C* to *D*.

Strategy 2: Build a Table

Since there is only one possible path from ***B*** → ***C***, we don't need to worry about having multiple options when we reach ***B***.

There are only choices at points ***A*** and ***C***.

Let's build a table that lists all of the possible choices at points ***A*** and ***C***.



There are **4** × **3** = **12** different paths that go from *A* to *B* to *C* to *D*.

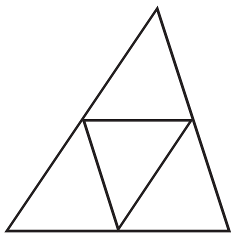
Answers **12**

Set Orange

2.1) The sum of the digits of the number 789 is 24.
How many 3-digit numbers have the sum of their digits equal to 24, including 789?

2.2) David buys a toy car.
He later sells it to Jessica and loses $3 on the deal.
Jessica makes a profit of $6 by selling it to Bryan for $25.
How much did David pay for the toy car?

2.3) How many four-sided figures can be traced, using only the lines in this picture?



2.4) I have 45 bricks in six stacks, all in a row.
Going from left to right, each stack is one brick taller than the previous stack.
How many bricks are in the smallest stack?

Example Problem 2.1 - Summary

Example Problem 2.1 - Green

Numbers such as 43 and 31 have their digits in decreasing order, because the ones digit is less than the tens digit.

The digits in 22 are not in decreasing order.

How many whole numbers between 10 and 59 inclusive have their digits in decreasing order?

Example Problem 2.1 - Yellow

Numbers such as 543 and 531 have their digits in decreasing order, because each digit is less than the digit to its left.

The digits in 322 are not in decreasing order.

How many whole numbers between 100 and 599 have their digits in decreasing order?

Example Problem 2.1 - Orange

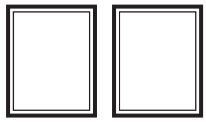
The sum of the digits of the number 789 is 24.

How many 3-digit numbers have the sum of their digits equal to 24, including 789?

Example Problem 2.2 - Summary

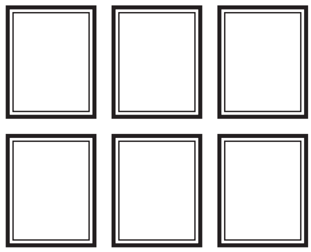
Example Problem 2.2 - Green

Emma paid $10 for the materials to make two identical picture frames.
She sold each frame for the same price and made $4 in profit.
How much did she charge for each frame?



Example Problem 2.2 - Yellow

Emma paid $18 for the materials to make a set of six identical picture frames.
She sold each frame for the same price and made $24 in profit.
How much did she charge for each frame?



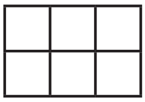
Example Problem 2.2 - Orange

David buys a toy car.
He later sells it to Jessica and loses $3 on the deal.
Jessica makes a profit of $6 by selling it to Bryan for $25.
How much did David pay for the toy car?

Example Problem 2.3 - Summary

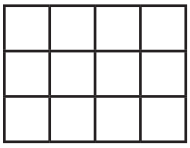
Example Problem 2.3 - Green

How many squares, of any size, can be traced on the lines in this diagram?



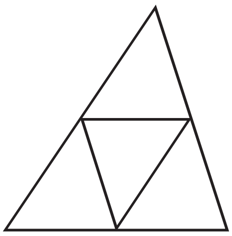
Example Problem 2.3 - Yellow

How many squares, of any size, can be traced on the lines in this diagram?



Example Problem 2.3 - Orange

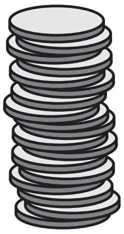
How many four-sided figures can be traced, using only the lines in this picture?



Example Problem 2.4 - Summary

Example Problem 2.4 - Green

I arranged my 18 coins into 3 stacks.
The second stack has one coin more than the first stack.
The third stack has one coin more than the second stack.
How many coins are there in the second stack?



Example Problem 2.4 - Yellow

I arranged my 18 coins into 3 stacks.
The second stack has two coins more than the first stack.
The third stack has two coins more than the second stack.
How many coins are there in the second stack?

Example Problem 2.4 - Orange

I have 45 bricks in six stacks, all in a row.
Going from left to right, each stack is one brick taller than the previous stack.
How many bricks are in the smallest stack?

Answers

Set Yellow		Set Green		Preparation Tasks		Set Orange	
2.1	20	**2.1**	15	**1**	5320	**2.1**	10
2.2	$7	**2.2**	$7	**2**	4	**2.2**	$22
2.3	20	**2.3**	8	**3**	6	**2.3**	6
2.4	6	**2.4**	6	**4**	12	**2.4**	5