

Maths Outdoor Trails

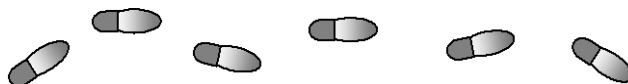
The following pages provide examples of maths trail questions and activities.

Maths trails not only help children improve their maths skills but also provide opportunities to be more observant, collaborative, independent and thoughtful about their immediate environment.

Learning outdoors should be a fundamental part of every child's experience and there is a great deal of evidence to demonstrate the positive impact of learning outside the classroom.

The first six pages in this section of the book provide 20 generic ideas covering a range of mathematical concepts – of varying levels of difficulty.

The second section has a page per year group - more specifically targeted in terms of ability and linked to the new curriculum. However, these can also be easily adapted for your children.



On the Thinking Child website – in the Free Downloads Section – you will be able to access these pages in Word format, so you can change and adapt them to suit your own outdoor space(s) and children's stage of development.

If you have ideas for maths trails to share with other schools, please feel free to send them into us at info@thinkingchild.org.uk

We will add them to the free download section on the site: www.thinkingchild.org.uk – with full acknowledgements of course.

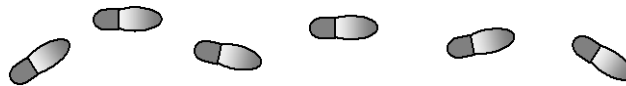
Maths Outdoors

1. Look around you. What can you see that has a mathematical connection?

Write or draw any mathematical words or shapes in and around the space you are in.



Write down in words or draw a mathematical sum.



2. With your group can you make some outdoor 'maths art'?

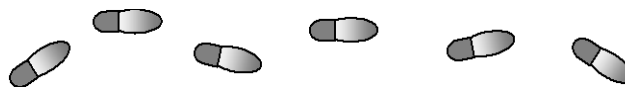
Each person in your group thinks of a different shape (straight line, star, triangle)

Then line up in different ways to form a human sculpture.

What natural materials or other objects are there in your space to make a piece of art from?

Can you make a frame with sticks?

Or a repeating pattern?



3. Have a look around and choose 3 or 4 buildings or objects (like a bench).

Can you stand in a space that is the same distance from all the things you have chosen. Estimate the distance.

Now test your estimate by pacing between each one. How close were you? Did you get it right? - yes/no/nearly/miles out? Re-calculate your central position and try again. (Remember that the smaller the object the closer you need to be to it).

Maths Outdoors

4. Go to a wall or pavement/path nearby. What patterns can you see?

Draw a section of it and then continue to repeat the pattern.

What shape(s) are used? Do they tessellate?



5. Look around and think about what might be the riskiest parts of the area? What sort of things could happen there and why? What is the probability of an accident?

6. On the outside doors of the school – do they all turn clockwise or anti-clockwise – or is there a mixture? What proportion of the handles turn clockwise?

7. Are the doors at the front of the school symmetrical? How do you know? Can you draw/measure them?

8. What shape is the letter box? Can you see other shapes like this? Where are they?

9. Face the school. Look at the bricks. What angle is the corner of the bricks? What angle is the corner of the school? Are there other angles on the front of the school? (are there sloping window sills for example?)

Can you estimate the number of bricks on one wall? Write down your method for estimating.

10. Go and find a sign on the school or a shelter. Which are the longest words – find the three longest and write them down. Which are the shortest? Count all the letters on the sign. Work out how many times each letter is used. Which letter is used most frequently?

Maths Outdoors



11. Look at the markings on the playground. Ask ten people which of the markings they like to play on the most and make a table/ tally chart of your findings:

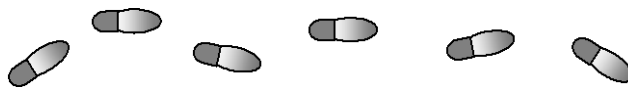
Marking	Number of children
Hopscotch	
Ladder	
Shapes	

Which is the favourite playground marking?

Which is the least favourite?

Think of a new marking or pattern you would like to see on the playground. Where is the best place to put it?

How will you know if there is enough space for it?



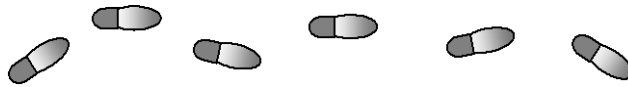
12. Look at the fences. How many vertical and horizontal bars are used in one part of the fence? Draw this one piece of the fence.

How many vertical bars does it take to make 7 pieces of fencing?

How many other things can you see that have vertical and horizontal lines?

Can you see oblique lines anywhere?

Maths Outdoors



13. Look at the bird table. Draw all the shapes you can see.

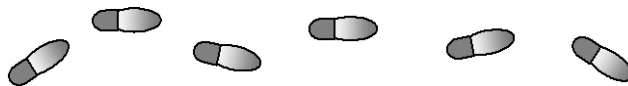
Which shape is used the most?

Why might that be?

Draw the shapes you can see in the bird table from two different sides.

Can you draw it from above – a 'birds' eye' view?

How many different angles can you see?



14. Find a bench. How many legs has it got?

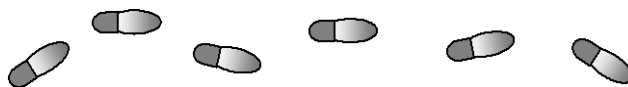
How many slats have been used to make it?

How many legs and slats would there be on 6 benches?

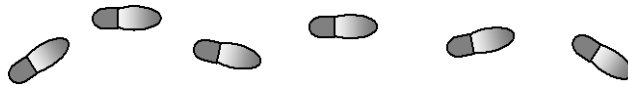
If there were 44 legs how many benches would there be?

If the bench is 2 metres long and the wood for the slats costs £2.00 per metre how much does it cost to make all the slats for the bench?

How much for 6 benches?



Maths Outdoors

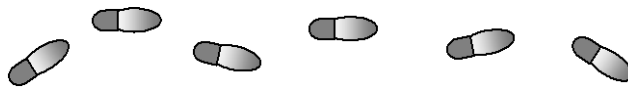


15. Find a tree and look at one of its leaves closely. How big is the leaf? Is it bigger or smaller than your hand?

How many leaves does it take to cover both of your hands?

What do you think the area of one leaf is?

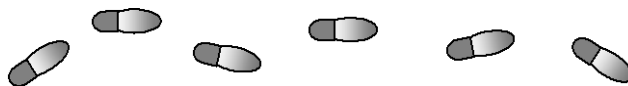
Fold the leaf in half. Is the leaf symmetrical? Can you see any more symmetrical shapes nearby?



16. Plan a route around the school for someone else to follow. But you can only use each path once.

Think of at least 5 'landmarks' you want them to notice – do they look left, right up or down to see them?

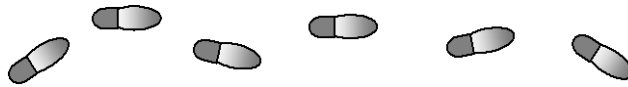
Alternatively you would draw a 'treasure map' – plot the coordinates or directions so people can find the next clue and eventually find the 'treasure'



17. Use sticks to make a small square frame on the grass. Can you estimate how many blades of grass there might be? Can you find a way to check your answer?

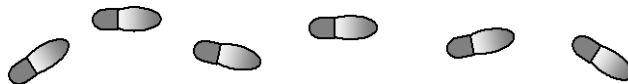
How many different types of grass or plants are there? How many might there be in a metre square? Or a ten metre square?

Maths Outdoors



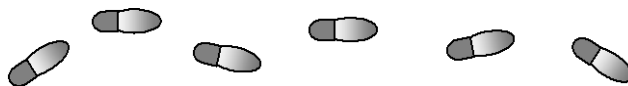
18. Choose two places to walk between – for example a tree and the edge of the playground. Estimate how long it will take you to walk between two places. Time each other to see who is the nearest.

How many seconds will it take to run or hop or stride?



19. Walk to the sundial. How many sides does it have? How many hours or minutes are marked on it?

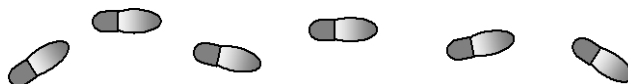
What time is it on the sundial? What time is it on someone's watch? Is the sundial correct? If not – how much difference is there? If you finish this maths trail in 30 minutes, what time will it be?

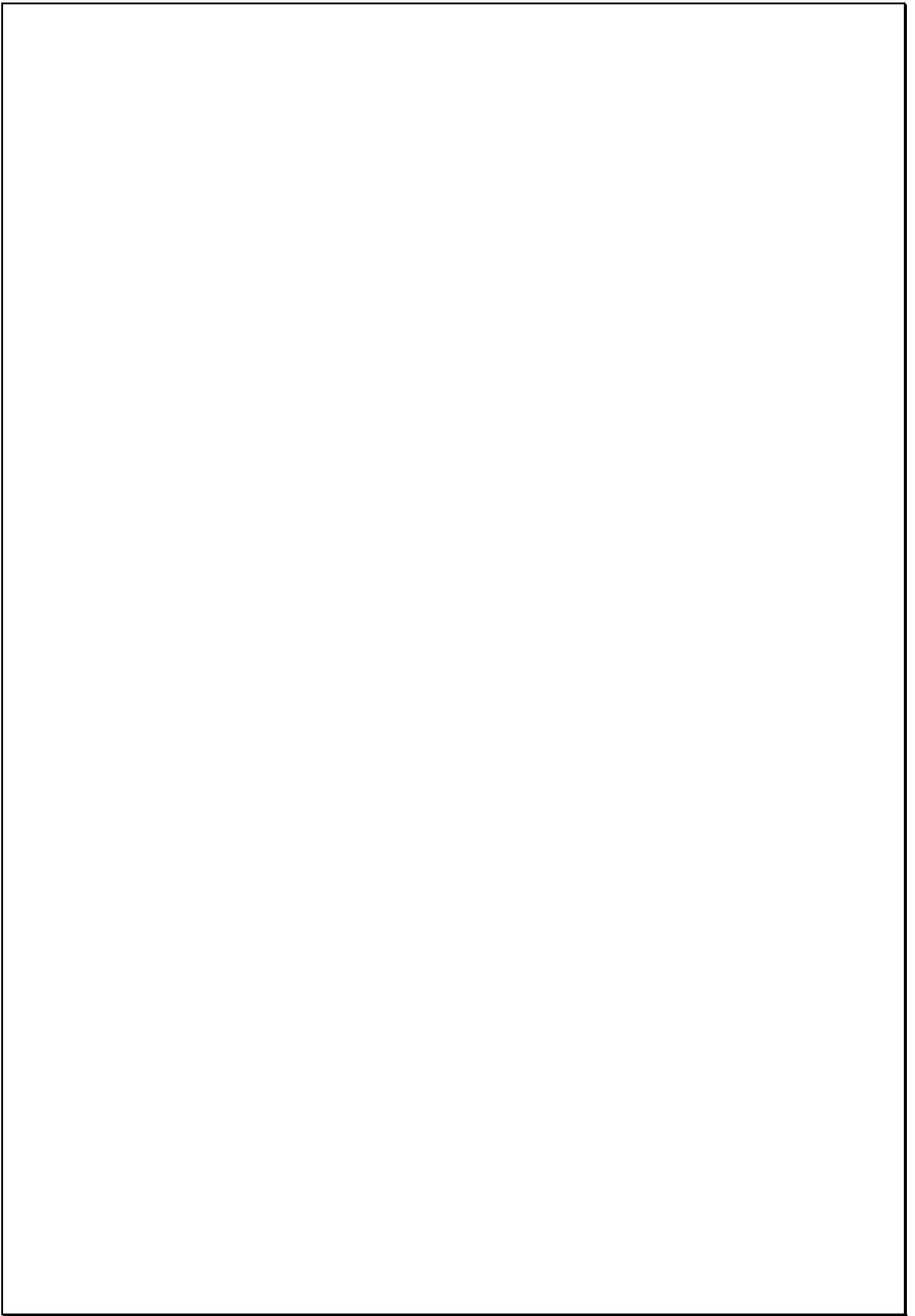


20. Use a compass – or let an adult tell you how to find North. Draw and label the four main points of the compass.

What direction is opposite West? What direction is opposite South-East?

Turn to face the East – what can you see? Make a half turn to your right – where are you facing now? Turn 3 right angles anti-clockwise – where are you facing now?





Around the School Maths Trail Year 1

Numeracy Focus: *Number. Shape. Measurement. Problem solving*

Suitable for: KS1 working in pairs

What you will need: Clipboards, trail sheets and pencils

What you do:

Use the template to add in the numbers, situations and locations relevant to your particular school.

You may choose to put the trail in a different order for different pairs/ groups of children.

Learning benefits:

- Children work independently in pairs (unless they need help with the reading)
- They are active
- Shows maths is everywhere
- Supports NC 2014 Programmes of Study for Maths

Year 1 Maths Trail
Start at the main entrance gate

Names.....

If you face the school entrance what is on your <i>left /right</i> ?		How many seats or benches are there?	
How many footsteps does it take from the school gate to the entrance?		How many <i>tiles</i> are there on half of the <i>shelter roof</i> ?	
What shape is the school sign?		How many foot lengths is a bench?	
Draw the pattern of the paving stones <i>on the path to the office</i> ?		How many windows look out on the playground?	
How many cars on the car park?		What shape is the ??	
What is one more than the number of cars in the car park?		How many gates are there?	
What is the number of <i>(red)</i> cars add the number of <i>(silver)</i> cars?		How many steps are there around the school?	
What is the biggest number you can see?		How many hands high is the <i>climbing frame</i> ?	
What is the smallest number you can see?		How many trees are there?	
How many doors are there on the outside of the building?		Can you find a <i>(3D shape)</i> ?	

Around the School Maths Trail Year 2

Numeracy Focus: *Number. Geometry. Measurement. Problem solving*

Suitable for: Year 2 working in pairs

What you will need:

Clipboards, trail sheets and pencils

What you do:

Use the template to add in the numbers, situations and locations relevant to your particular school.

You may choose to put the trail in a different order for different pairs/ groups of children.

Learning benefits:

- Children work independently in pairs (some may need help with the reading)
- Active learning
- Shows that Maths is everywhere
- Supports NC 2014 Programmes of Study for Maths

Year 2 Maths Trail
Start at the main entrance gate

Names.....

If you face the school entrance what is a quarter turn on your <i>left /right?</i>		How many shelters are there?	
What shapes can you see <i>in the trellis by the front door?</i>		If 10 children can play in one shelter, how many children can play in the shelters altogether?	
What is the unit number in the telephone number on the school sign?		Estimate how many metres and centimetres the bench is.	
How many paving slabs are there <i>on the path to the office?</i>		How many windows that look out on the playground are square?	
How many cars on the car park have a number 6?		Can you find a <i>3D shape?</i> What is it and what is the shape called?	
What is ten more than the number of cars in the car park?		How many gates are there?	
What is the number of <i>(red)</i> cars minus the number of <i>(silver)</i> cars?		How many steps are there around the school?	
What is the biggest number you can see take away 10?		How many rectangles are there on the <i>climbing frame?</i>	
What is the smallest number you can see add 10?		How many trees that are more than 2 metres high?	

Around the School Maths Trail – Year 3

Numeracy Focus: *Number. Geometry. Measurement. Problem solving*

Suitable for: Year 3 working in pairs

What you will need: Clipboards, trail sheets and pencils. Rulers.

What you do:

Use the template overleaf and add in the numbers and situations or locations relevant to your particular school where the text is in italics. You may like to put it in order of the way they will come across the answers.

Learning benefits:

- Children work independently in pairs
- Active learning
- Shows that Maths is everywhere
- Consolidates learning
- Supports NC 2014 Programmes of Study

Year 3 Maths Trail
Start at the main entrance gate

Names.....

If you face the school entrance what do you see if you turn 2 right angles clockwise?		How many seats or benches are there?	
Estimate the height of the front entrance door.		If 30 children wanted to sit down how many benches would we need altogether?	
Add up the digits in the telephone number on the school sign.		Is the angle of the shelter roof acute or obtuse?	
What is the area of one of the paving slabs <i>on the path to the office?</i>		How many windows look out on the playground? What is half that number?	
How many cars in the car park have a number greater than 6?		What shape is the ??	
What is 100 more than the number of cars in the car park?		How many gates are there? How many slats in all the gates?	
What is the number of <i>(red)</i> cars times the number of <i>(silver)</i> cars?		What fraction of the numbers on the number snake is odd?	
What is half the biggest number you can find?		What is the length of the swing seat?	
What is double the smallest number you can find?		How many bushes are < 1m in the border next to Class 1?	
How many symmetrical doors are there on the outside of the building?		Can you find a <i>(3D shape)?</i>	

Around the School Maths Trail Year 4

Numeracy Focus: *Number. Geometry. Measurement. Ratio.*
Problem solving

Suitable for: Year 4 working in pairs

What you will need: Clipboards. Trail sheets. Pencils. Rulers.

What you do:

Use the template overleaf and add in the numbers, situations or locations relevant to your particular school, especially where the text is in italics. You may like to put the trail in order of the way they will come across the answers.

Learning benefits:

- Children work independently in pairs
- Active learning
- Shows that maths is everywhere
- Supports NC 2014 Programmes of Study for Maths

Year 4 Maths Trail
Start at the main entrance gate

Names.....

If you face the school entrance what do you see if you turn 180° anti-clockwise?		How many seats or benches are there?	
What unit of measure would you use to measure the height of the arch of the porch?		If 50 children wanted to sit down how many more benches would we need?	
What is the tens digit x the hundred digit in the telephone number on the school sign?		Can you find a set of perpendicular lines on the playground? Where are they?	
What is the perimeter of two of the paving slabs on the path to the office?		How many windows look out on the playground? Divide that number by 2.	
How many cars in the car park have a number $6 < 8$?		Can you find a (3D shape)? Where?	
What is 150 more than the number of cars in the car park?		How much taller than you is the top of the climbing frame?	
What fraction of the cars in the car park is red? What fraction is silver?		Draw the How many lines of symmetry does it have?	
Choose 4 digits from 2 number plates. What is the biggest number you can make with them?		Which angle is biggest – the apex (point) of the shed roof or a right angle?	
What is the smallest number you can see times 7?		Find an acute angle – where is it?	

Around the School Maths Trail Year 5

Numeracy Focus: *Number. Geometry. Measurement. Ratio.
Problem solving*

Suitable for: Year 5 working in pairs

What you will need: Clipboards. Trail sheets. Pencils. Rulers. Calculators

What you do:

Use the template overleaf and add in the numbers, situations or locations relevant to your particular school, especially where the text is in italics. You may like to put the trail in order of the way they will come across the answers.

Learning benefits:

- Children work independently in pairs
- Active learning
- Shows that maths is everywhere
- Supports NC 2014 Programmes of Study for Maths

Year 5 Maths Trail
Start at the main entrance gate

Names.....

If you face the school entrance what do you see two right angles clockwise?		How many bricks are there in one metre square?	
Can you draw the shapes in the trellis by the front door accurately?		If we wanted to build a wall a metre long by 50cm high, how many bricks would we need?	
What is the biggest number you can make with the six digits in the telephone number on the school sign?		Estimate the angle of the ramp leading to the girls' cloakroom door.	
What is the area of one of the paving slabs on the path to the office?		How many rectangles make the windows which look out on the playground altogether?	
Which prime numbers can you find on the number plates in the car park?		What shape is the.....	
What is the number of cars in the car park squared?		Estimate the perimeter of the school fence .	
Round the number of cars in the car park to the nearest 10. What is 2 tenths of that number?		Find 3 different types of triangle – where are they and what are they called?	
What is the biggest 2 digit number you can see on a car number plate?		How many doors are there on the outside of the building?	
What are its factors?		Face the door of Class 4 , turn through 270°. What do you see?	

Around the School Maths Trail Year 6

Numeracy Focus: *Number. Geometry. Measurement. Ratio.*
Problem solving

Suitable for: KS2 working in pairs

What you will need: Clipboards. Trail sheets. Pencils. Rulers. Calculators

What you do:

Use the template overleaf and add in the numbers, situations or locations relevant to your particular school, especially where the text is in italics. You may like to put the trail in order of the way they will come across the answers.

Learning benefits:

- Children work independently in pairs
- Active learning
- Shows that maths is everywhere
- Supports NC 2014 Programmes of Study for Maths

Year 6 Maths Trail
Start at the main entrance gate

Names.....

If you face the school entrance what is 90° to your <i>left/ right</i> ?		Stand on the playground and face the school, now turn 180° . What is facing you?	
Estimate how many metres it is from the school gate to the entrance?		If we wanted 60% of the school to be able to sit on a bench, how many more benches would we need?	
How many lines of symmetry do the school sign have?		Estimate how many roof tiles are there on the staff room roof ?	
If four paving slabs cost £12 how much did the path to the office cost to build?		What proportion of the school windows look out on the playground?	
If 0.5 of the car park was iced over how many spaces would be available?		If each child needs 1sq metre to play on what is the maximum number who can play in the playground at any one time?	
If 1kg of road salt was enough to de-ice 2 car park spaces, how much would we need?		Collect two registration numbers that total 113	
What fraction of the cars is (red) ?		If we wanted to put up 2 metre fence panels across the playground to divide it in half, how many would we need?	
What area of land does the pond/ outside shed/cover ?			

Other resources from Thinking Child include:

Over 100 Ideas for Outdoor Literacy

Let's Think Homework

IT'S A CASE OF GRAMMAR

Starters for Thinking cards

The Literacy Box

The Numeracy Box

Visit the website: www.thinkingchild.org.uk

Or phone for more information: 01604 491511