Mathematics 4 Thinking Tasks
Talking Points

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Introduction

- Tasks are not arranged in any specific order and can be completed at any time to suit, say, curriculum coverage within your class.

- Provide a context for tasks where possible. Some tasks are likely to be more successful when given a purpose, reason or final outcome. Linking to other areas of the curriculum is particularly effective.

- Prior discussion, or in some cases class/group preparation activities, will maximise the potential of the task and enable each child to work independently and to the best of his/her ability.

- Follow-up work will enable the teacher to assess understanding, clarify misconceptions and challenge each child's ability to explain and apply what they have learned. It will also provide children with an opportunity to show-case their learning and ask questions about anything they have not fully understood.

- Checking the children's understanding of all key vocabulary when setting the task will avoid confusion or difficulties when the children are completing the homework independently.

- When introducing the homework it may be appropriate to help children to set out their working page so that they learn how to present their work clearly.

- Providing concrete materials such as coins or counters might support children who would otherwise have difficulty with some tasks.

- Some tasks are more/less challenging than others. It may be necessary to differentiate by offering more support or additional information to some groups of children or by extending with an additional challenge for the more able members of the class.

		Talking Points		
T	**Thinking about**	**Introduction and Prior Discussion**	**Organisation and Follow-up**	**Vocabulary**
1	numerical awareness numerical representation data collection Roman numerals to 100	• What do Roman numerals look like and how do they work? • What is meant by numerical data? • What type of data might be used? • How will you present your information?	• Appropriate for use early in the year. • Possible link to PSHE collection of personal data. • How is the Roman number system different from the system we use?	numerical data table numerals Roman numerals
2	numerical awareness rounding numbers estimation	• Why might we need to round a number? • What are the rules for rounding numbers? • Where might you find ten different books?	• Appropriate for use early in the year. • When is it useful to round numbers to the nearest multiple of 10 or 100?	round

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		Introduction and Prior Discussion	**Organisation and Follow-up**	
3	numerical awareness place value number fact recall calculation	• Which key facts will you need to use for this task? • What do you know about multiplication and division? • How might knowing that each number is even help you? • How will you set out your work?	• What strategies did you use to help you?	even multiplication division
4	numerical awareness place value comparison ordering calculation	• What happens to the value of a digit when its position changes? • How can you make sure that you have found the largest and smallest possible number? • How will you set out your work?	• Appropriate for use quite early in the year. • What strategies did you use? • What difficulties did you experience?	digits largest smallest
5	numerical awareness numerical representation data collection information presentation ordering Roman numerals to 100	• What is an extended family? • Who is the oldest person in your extended family? • Who else might you include on your number line? • What is the difference between numerical order and chronological order? • What effect would using chronological order have on the presentation of the information?	• Possible link to a local history study. • What are the two main differences between Roman numerals and the numerals we use today?	extended family number line numerical order convert
6	numerical awareness ordering	• What is meant by 'halfway between'? • How could you use the hundred square to help you with this task? • What other methods could you use?	• When are you likely to get an answer which involves a fraction? • What was your preferred method and why?	halfway between midway
7	problem solving investigating testing an idea numerical awareness calculation	• What is meant by a rule? • What happens when you add two even numbers? • What happens when you add two odd numbers? • What might you do to test the statement?	• How could you use a drawing or diagram to prove that you are right?	even odd investigate rule

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		Talking Points		
8	problem solving money calculation	• Can you estimate how much money you think could be made? • What information would you need to use? • How will you set your work out?	• Possible link to a school fundraising opportunity. • How could you increase the amount of money you made?	charity calculate altogether
9	numerical awareness place value decimals ordering	• What is the role of the decimal point in a number? • What happens to the value of a digit when it moves to the left? • What happens to the value of a digit when it moves to the right?	• How many different numbers is it possible to make with your eight digits?	digits decimal point value
10	drawing pictorial representation fractions relationships	• What is meant by the word "grid"? • What is the link between the fractions and the size of each square you need to draw?	• The term grid is used here to avoid repetition and confusion with the word square. • Why was it helpful to use a 6 × 6 grid? • What other size could you have used and why?	fraction grid
11	measurement estimation calculation	• Why should the items you use be unopened and packaged? • How will you find the actual weight of each item? • What is meant by 'comfortable weight for you to carry' and how could it be tested?	• Adult help or co-operation may be needed for this task • Possible link to a science study on the human body. • How did you find the difference in weight between the two bags?	estimate actual weight total weight the difference
12	problem solving research calculation	• How could you find out the price of a stamp?	• Setting this task in December would provide context as a time when people may be using stamps to send cards. • Possible link to English through persuasive argument writing outlining pros and cons (cost/value) of sending Christmas cards.	calculation even zero total

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		Introduction and Prior Discussion	Organisation and Follow-up	
13	estimation calculation money shopping	• How might you estimate the total cost before calculating? What maths skills could you use to help you to do this? • Why is it important to be able to estimate total costs when going shopping?	• Which maths skills did you use to check your work?	receipt price total change value cost
14	problem solving decision making questioning calculation	• Is the order of the calculations important? • How can you make sure that you always end with zero?	• What systematic methods did you use? • Did you notice any patterns?	number machine total zero calculation odd and even
15	problem solving visual representation spatial awareness visualisation	• What key information do you need to remember? • How many empty squares will there be in each row and column?	• What systematic methods did you use? • Did you notice any patterns?	horizontal vertical diagonal
16	measurement maps and plans pictorial representation drawing	• What is the difference between a sketch and a final plan? • Which units of measurement will you use? • Why is it important to measure accurately? • How might you use the squares on the page to help you with laying out your plan? • Which is the best page orientation to suit a plan?	• Possible link to geography through maps and plans. • Children should work roughly before attempting their final plan. Grey pages could be used for this purpose. • The plan need not be to scale but children could be challenged to attempt this if appropriate.	plan sketch measure perimeter accurately
17	measurement data collection pictorial representation analysing information	• How will you measure your own height? • How can you measure someone taller than yourself? • Which units of measurement could you use on the graph? • Why is it important to measure accurately?	• What difficulties did you have? • What was the easiest method you used?	measure height bar chart

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		Introduction and Prior Discussion	**Organisation and Follow-up**	
18	sorting collecting ordering estimating drawing pictorial representation measuring area	• How will you set out your leaves to fit them all on the page? • How accurate will the measurement be if you only count whole squares?	• Two coloured writing pages will be needed for this task. It would be preferable to use two facing pages. • Children should plan first and decide which page orientation best suits their work. • How accurate were your estimates?	estimate approximate area accurate
19	decision making timetabling ordering	• What is meant by 'perfect day'? • What sorts of activities would you include in your perfect day? • What will you need to consider when planning your timetable?	• Does your perfect day look the same as anyone else's? • Where did you spend most of your time, indoors or out? • Is your perfect day practical?	timetable maximum
20	data collection and recording understanding data	• How much of you day do you think you spend sleeping? • How will you set out your sleep diary? • What will be the best way to orientate your page?	• Possible link to science or PSHE. • What have you learned about the importance of sleep?	difference diary
21	problem solving reasoning pictorial representation planning visualisation identifying patterns combinations	• How many different one storey houses could be painted using two colours? • How many different two storey houses could be painted using two colours? • What strategies could you use to find the answer to these questions?	• If Mr Dawson used three colours how many different three storey houses could he have? • For the benefit of teachers an explanation follows. You may choose to share some of this with your class. • Where n is the number of colours and s the number of storeys the formula becomes n^s. | Number of storeys	formula n^s	Number of different houses
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1	2	2
2	2 x 2	4
3	2 x 2 x 2	8
4	2 x 2 x 2 x2	16		combination storey possibilities

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		Introduction and Prior Discussion	**Organisation and Follow-up**	
22	planning time	• What is meant by special days? • How will you set out your work?		future calendar diary week day
23	data collection estimation time measurement time management planning	• Why is it useful to know how long things might take? • How will you set out your work?	• How might your personal morning timetable help you? • Are there any other times of the day when it would be useful to have a timetable? • How does you timetable compare with someone else's?	estimate record compare timetable

24	problem solving
	spatial relationships
	visualisation
	geometry
	area
	design
	creativity
		• _Key ideas:_
		  - all pieces must touch.
		  - all pieces must be flat.
		  - no pieces may overlap.
		  - pieces may be rotated and/or flipped.
		• How will you hold you pieces still while you draw round them?
			• The shapes must be cut out carefully through the centre of the white lines to ensure they fit together accurately. It might be helpful to stick the triangle on card before cutting the shapes out.	Tangram

25	data collection design colour awareness surveying	• Which would be the best room in your house to choose? Why? • Are there any rooms you would not choose?	• What do you know now that you did not know before?	colour theme frequency table column tally frequent information
26	problem solving decision making units of time calculation	• What strategies could you use to complete this task? • What do you already know and what do you need to find out?	• Were there any answers that you could not make? • What did you find out that was particularly helpful?	calculations addition subtraction multiplication division

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		Introduction and Prior Discussion	Organisation and Follow-up	
27	problem solving combinations	• What strategies could you use to solve this problem? • Can your customers have two scoops of the same flavour? • How many different two scoop ice creams could be made using three different flavours? What are they? • What information will you need to include on your table?	• This task could be linked to an actual event; a whole school fundraising event or an end of term celebration or treat. • What difficulties did you have? • Which do you think would be the most popular combination? How could you find out?	combinations
28	numerical awareness calculations	• What strategies could you use to complete this task?	• Appropriate for use quite early in the year. • Which 3-digit or 2 digit numbers can be reduced to 1 in exactly ten moves? • What is the least number of moves needed for a 2 or 3 digit number?	number chain odd/ even half sequence rule record explain
29	symmetry shape pictorial representation drawing observation	• How do you know when something is symmetrical?	• What difficulties did you have?	symmetrical line of symmetry
30	pictorial representation maps and plans	• What is a sketch map? • How can you find out which direction your home faces? • How do you travel to school each day? What difference will this make to the task? • What could you do to help you to complete this task successfully?	• Possible link to geography through maps and plans. • What difficulties did you experience? • How did you overcome them? • Could some one else understand your directions and use them to travel to school?	directions turning points compass direction approximate