

Talking Points

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 & Prior Discussion	Organisation & Follow-up	Vocabulary
1	books publishing estimation approximation	<ul style="list-style-type: none"> • What is the difference between estimation and approximation? • What information do you have? • How will you use it to solve the problem? • What do you need to think about when choosing your book? 	<ul style="list-style-type: none"> • How might knowing the approximate number of words in a book or on a page be useful? • How good are you at estimating? • How can you improve your estimating skills? 	estimate approximate
2	problem solving decision making measurement coins	<ul style="list-style-type: none"> • Is it important to measure accurately to the nearest millimetre? 	<ul style="list-style-type: none"> • Could the statement be true about any other pair of coins? 	metre exactly measure row

Mathematics 5 Thinking Tasks: Talking Points



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T	Thinking about	Introduction & Prior Discussion	Organisation & Follow-up	Vocabulary
3	numbers fact recall	<ul style="list-style-type: none"> • What sorts of number facts might you use? • Can you identify any everyday facts as well as mathematical facts? 	<ul style="list-style-type: none"> • Did you find any patterns? • Do any numbers behave in a similar way? • Which numbers had the most facts? 	odd/even multiple square/prime/ triangular number factor
4	time management fractions	<ul style="list-style-type: none"> • Why is the denominator 24? • How do we convert fractions to their simplest form? • Which fraction family will you use? 	<ul style="list-style-type: none"> • What have you learned about how you spend your time? 	fraction round up
5	money management budgeting money percentages	<ul style="list-style-type: none"> • What maths will you need to use to complete the task? • How do we find 10% of an amount? • Will it be necessary to round up/down totals to the nearest whole? 	<ul style="list-style-type: none"> • What does this tell you about the pricing of goods in shops? 	bill reduction total %
6	vehicle registration research ordering data collection interpreting data	<ul style="list-style-type: none"> • Why do you think vehicles have registration plates? • What do you know about vehicle registration plates? • Look at an example of a registration plate. Can you see a pattern/structure/system to the letters and numbers? 	<ul style="list-style-type: none"> • What information do vehicle registration numbers contain that might be useful? • How might this information be useful and who might use it? • Provision might need to be made for children who do not have access to the internet. 	alphabetical order date order Area code Age Identifier
7	problem solving decision making money management	<ul style="list-style-type: none"> • Before calculating which of the options would you choose and why? Ideas and reasons why could be shared in groups. 	<ul style="list-style-type: none"> • Was the outcome as you expected? Why? • How might this the information be useful? 	double most
8	problem solving spatial awareness drawing	<ul style="list-style-type: none"> • What might help you to record this task and keep track of the different shapes? 	<ul style="list-style-type: none"> • What strategies did you use to help you? • The 2nd part is aimed at arriving at a negative outcome, ie, in a similar shape, 26 rectangles are not possible. • Opportunity to explore further if similar shapes can be drawn from 4x2, 3x3 grids [30, 36 respectively]. 	rectangle diagram similar

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9	time management timetabling data collection interpreting data presentation of ideas	<ul style="list-style-type: none"> • What is meant by 'a typical week'? What sort of week would not be typical? • What activity headings will you include? • How might you collect your data? 	<ul style="list-style-type: none"> • Activities identified on the table are for exemplification purposes only children may select their own. • What have you learned about yourself and your use of time this week? 	typical data
10	problem solving research planning investigations presentation of ideas data collection physical exercise healthy lifestyle making choices	<ul style="list-style-type: none"> • What is meant by a step? (toe by toe or stride) • How would you measure a step? (agree class definition either toe by toe or full stride) • What is your average step/stride length? • How would you measure your step/stride? • How far is 12 000 steps in your estimation? 	<ul style="list-style-type: none"> • Possible link to science, PE, PSHE and the importance of exercise in a healthy lifestyle. • The task may also lend itself to a written report using bullet points and a clear simple, layout. • The emphasis of the task is on how they would use information to investigate the number of steps they take in a day rather than on calculating an accurate answer. 	table calculate total
11	money planning research budgeting financial management currency exchange	<ul style="list-style-type: none"> • What is meant by 'a European country'? • What European currencies are they aware of? • How might you find out about different currencies? 	<ul style="list-style-type: none"> • Possible link to modern foreign languages and cultural studies. • Potential for group discussion and team work in planning the choice of country and activities to be undertaken on trip. • What have you learned about preparing for a trip? • What have you found out about currency exchange? 	European budget table estimate total amount currency exchange rate
12	problem solving decision making spatial awareness measurement	<ul style="list-style-type: none"> • What do you know about area and perimeter? • Which statement appears most reasonable? • How will you test each statement? 	<ul style="list-style-type: none"> • Link to work on area and perimeter. • What have you learned about area and perimeter? 	rectangular perimeter area twice
13	spatial awareness estimation drawing measurement calculation	<ul style="list-style-type: none"> • What equipment will you require? • How much string do you think it might take? 	<ul style="list-style-type: none"> • How accurate was your calculation? • How close was your estimation? 	length width height area volume

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14	spatial awareness systematic investigation angles dial reading	<ul style="list-style-type: none"> • What do you know about angles? • What do you need to know in order to carry out this investigation? • What does it mean when it says 'work methodically'? 	<ul style="list-style-type: none"> • Link to work on angles. • Reference L21 • What strategies did you use to help you? 	angle hour hand minute hand methodically
15	history chronology Roman numerals in context planning and decision making creativity and presentation design	<ul style="list-style-type: none"> • What is the difference between numerical and chronological order? • What makes a good poster? (potential for group discussion) • What is the purpose of your poster? • What are the key features of your poster? • What might be the best orientation of the page to suit your design? 	<ul style="list-style-type: none"> • Possible link to either history or English studies. • Children should plan poster first and then decide which page orientation best suits their work. Grey pages could be used for this. 	chronological
16	weather prediction and recording fair testing procedures data collection – methods and sources reading a thermometer	<ul style="list-style-type: none"> • What range of temperatures might you expect at this time of year? • How might you collect your information? • What will the information table look like? • What might be the best orientation of the page to suit your design? 	<ul style="list-style-type: none"> • Possible link to science or English studies. • E5 P29c looks at writing a weather report. • Children should plan their table first and then decide which page orientation best suits their work. 	consecutive prediction table accuracy
17	spatial awareness properties of shapes design	<ul style="list-style-type: none"> • Look at a range of everyday objects. How does their shape facilitate their purpose? Could they be any other shape? 	<ul style="list-style-type: none"> • Possible link to work on 3-D shapes or design. • Why do certain shapes rarely appear as man-made objects? 	cuboid cylindrical sphere
18	symmetry spatial awareness drawing design creativity	<ul style="list-style-type: none"> • What is meant by symmetrical? • How would you test to see if something were symmetrical? • What might be the best orientation of the page to suit your drawings? 	<ul style="list-style-type: none"> • Children should plan first and decide which page orientation best suits their work. 	symmetry symmetrical

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19	symmetry spatial awareness planning design creativity	<ul style="list-style-type: none"> • <u>Key idea</u>: squares which touch a coloured square on <u>only one side</u> can be coloured in but <u>not all</u> possible squares have to be coloured. • How will you find the centre of the page? • What might be the best orientation of the page to suit your drawings? 	<ul style="list-style-type: none"> • Opportunity for paired working to explore the key idea before they begin on their own designs. • Children should plan first and decide which page orientation best suits their work. • Rotating the page as they work on their design will enable children to check symmetry. 	symmetrical															
20	problem solving spatial relationships visualisation geometric vocabulary and skills area design and creativity	<ul style="list-style-type: none"> • <u>Key ideas</u>: <ul style="list-style-type: none"> - all pieces must touch. - all pieces must be flat. - no pieces may overlap. - pieces may be rotated and/or flipped. • What are the basic shapes within the Tangram? 	<ul style="list-style-type: none"> • Two coloured writing pages will be needed for this task. It would be preferable to use two facing pages. • The Tangram pieces 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 Tangram on card before cutting out the shapes. • Were there any polygons that you could not make? 	Tangram polygons															
21	problem solving decision making spatial awareness drawing investigation geometry	<ul style="list-style-type: none"> • <u>Key idea</u>: <ul style="list-style-type: none"> - make the largest possible number of triangles by drawing lines from point to point across a polygon. • Which key facts might help you with this task? • What do you need to think about? • What might help you to find a pattern? • How might you record your results? <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Polygon</th> <th>square</th> <th>pentagon</th> <th>hexagon</th> <th>heptagon</th> </tr> </thead> <tbody> <tr> <td># sides</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td># triangles</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </tbody> </table>	Polygon	square	pentagon	hexagon	heptagon	# sides	4	5	6	7	# triangles	2	3	4	5	<ul style="list-style-type: none"> • Two coloured, facing writing pages will be needed. • <u>Key facts</u>: <ul style="list-style-type: none"> - diagonals divide polygons into triangles; - the sum of the inside angles of a triangle is 180° and a quadrilateral is 360°. • The pattern children should notice is that the largest number of triangles is 2 less than the number of sides or points - see table. • How might you use what you know about the number of triangles in a polygon to find the sum of the inside angles of any polygon? • How might you use what you know to calculate the number of triangles in a decagon without drawing it and then to calculate the sum of its inside angles? • What's the formula? • $x =$ number of sides; $(x - 2)180 =$ sum of the interior angles 	points plot clockwise rule diagonal
Polygon	square	pentagon	hexagon	heptagon															
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22	symmetry spatial awareness visualisation design creativity	<ul style="list-style-type: none"> • What word describes the image you are creating? • What do you need to think about when setting out your work? • Which letters are likely to be easier to use for this purpose? Why? 	<ul style="list-style-type: none"> • Children should plan first and decide which page orientation best suits their work. 	mirror line reflect
23	books publishing approximating calculating	<ul style="list-style-type: none"> • What key information do you need to use? • How will you set out your calculations to show your working method? 	<ul style="list-style-type: none"> • Why is it useful to know how much space your writing takes up? • When might you use this information? 	average
24	mathematical problems and patterns measurement proportion design creativity research	<ul style="list-style-type: none"> • <i>Key idea:</i> proportion • What does proportion mean? • How much of your height is taken up by your legs? How many hands fit into the length of your arms? 	<ul style="list-style-type: none"> • Opportunity for groups to discuss what is meant by proportion. • Possible link to studies in science or art. • Reference the work of Leonardo Da Vinci. Illustration based on: Proportions of the human figure, Leonardo Da Vinci, 1485 • What can you find out about the work of Da Vinci? 	measure compare height reach stride perimeter
25	planning decision making discussion organisation team work scheduling timetables	<ul style="list-style-type: none"> • What information do you need in order to plan the event? • What do you need to think about when planning an event of this type? • Is it reasonable if every act overruns by 10 min? What are the implications of over-running? • How will you present the information? What format could your timetable take? 	<ul style="list-style-type: none"> • This task is likely to work more effectively if linked to an actual event; a whole school fundraising event or an end of term celebration of talent perhaps. • Opportunity for group work, discussion and decision making in planning the event. 	programme approximately timetable

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26	problem solving decision making prediction	<ul style="list-style-type: none"> • What is a prediction? • What sort of evidence would prove/disprove the statement? 	<ul style="list-style-type: none"> • Would your results be the same if you tossed the coin or rolled the die 50 times? • Why is this important? 	prediction even odd evidence																																								
27	problem solving identifying patterns calculating	<ul style="list-style-type: none"> • <i>Key idea</i>: the number you start with is the number you finish with; March 27th or 327. • <i>Key facts</i>: multiplication is the inverse of division and subtraction is the inverse of addition. Whatever is divided must be multiplication and whatever is added must be subtraction in order to reverse an operation? • How do you record dates numerically? • How do you reverse multiplication? • How do you reverse addition? • Now try to make up your own sequences of calculations to produce similar mathematical tricks. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>operation</th> <th>Month</th> <th>+</th> <th>day</th> </tr> </thead> <tbody> <tr> <td></td> <td>M1 (3)</td> <td>+</td> <td>0</td> </tr> <tr> <td>x5</td> <td>M5 (15)</td> <td>+</td> <td>0</td> </tr> <tr> <td>+6</td> <td>M5 (15)</td> <td>+</td> <td>6</td> </tr> <tr> <td>x4</td> <td>M20 (60)</td> <td>+</td> <td>24</td> </tr> <tr> <td>+9</td> <td>M20 (60)</td> <td>+</td> <td>33</td> </tr> <tr> <td>x5</td> <td>M100 (300)</td> <td>+</td> <td>165</td> </tr> <tr> <td>+D</td> <td>M100 (300)</td> <td>+</td> <td>165+D (192)</td> </tr> <tr> <td>-165</td> <td>M100 (300)</td> <td>+</td> <td>D (27)</td> </tr> <tr> <td>Final Total</td> <td colspan="3">M100 + D (327)</td> </tr> </tbody> </table>	operation	Month	+	day		M1 (3)	+	0	x5	M5 (15)	+	0	+6	M5 (15)	+	6	x4	M20 (60)	+	24	+9	M20 (60)	+	33	x5	M100 (300)	+	165	+D	M100 (300)	+	165+D (192)	-165	M100 (300)	+	D (27)	Final Total	M100 + D (327)			<ul style="list-style-type: none"> • The children are not expected to provide a detailed explanation or formula to explain why this works but they might pick up on some points, such as: • The final number (327) is the number of the month(M) \times 100 + the number of the day (D) • Operations $2(\times 5)$, $4(\times 4)$, and $6(\times 5)$ have an outcome equal to $(\times 100)$. • Operation $6(\times 5)$: produces a number which is $(M \times 100) + 165$ • Operations $4 - 7 : (6 \times 4) + 9 = 33$ and $33 \times 5 = 165$. • FYI: you may choose to share some of this with your class: <ul style="list-style-type: none"> - by beginning with the number of the month (3), the puzzle starts after two operations have already been completed: $(327-27) \div 100 = 3$ - the puzzle gives operations to reverse this process thus returning to 327 or March 27th. - the puzzle can be split into two strands – numbers relating to the month (M) and those relating to the day (D) day. 	multiply add subtract
operation	Month	+	day																																									
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28	spatial awareness design drawing patterns creativity	<ul style="list-style-type: none"> • What do you need to think about before choosing your starting point? • What is the angle of turn if you follow the lines on the page? 	<ul style="list-style-type: none"> • Two coloured, facing writing pages will be needed for this task. I • Children should plan first and decide which page orientation best suits their work. • Link to work on angles. • Possible link to art. Design, plan and create a spiral pattern extended over a large area and incorporating different colours and media. • What difference would it make if you changed the angle of turn? 	spiral numeral digit sequence reverse
29	using and applying maths asking questions organisation discussion decision making team work event planning calculation	<ul style="list-style-type: none"> • What key information do you need in order to plan the event? • How can you use questions to direct your thinking? • Where might you look for the information you need? 	<ul style="list-style-type: none"> • This task lends itself to being linked to a real situation or event. • Opportunity for children to work in groups for discussion, planning and decision making. • Focus of task is planning and questioning rather than calculating. • How useful is maths when planning an event of this sort? 	thinking question total amount calculate
30	decision making measurement entertaining cooking and recipes taste testing calculating estimating	<ul style="list-style-type: none"> • What key information will you need to use? • What questions do you need to answer? • How will you set out your work? 	<ul style="list-style-type: none"> • This task lends itself to being linked to a real situation such as an end of year class party. • Possible link to Design and Technology. • Is this the best recipe for a punch? • What about inventing and testing different recipes to produce a recipe book for fruit punch? 	punch estimate calculate amount litre