

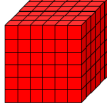












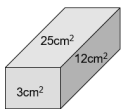



SUPER-CURRICULAR ACTIVITIES

Pre-GCSE: Mathematics Year 9

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|  <p>Read 'The Math Book' by Clifford A Pickover.</p> |   <p>A 6 x 6 cube is painted red. It is then cut up into a number of identical cubes as shown in the picture.</p> <p>How many of the cubes have (a) 3 red faces (b) 2 red faces (c) 1 red face (d) 0 red faces</p> <p>What would the answers be for an $n \times n$ cube?</p> |  <p>Exactly how many minutes is it before six o'clock if 50 minutes ago it was four times as many minutes past three o'clock?</p> |
|  <p>One night two candles were lit, one of which was 3cm longer than the other. The longer one was lit at 5.30pm and the shorter one at 7pm. At 9.30pm they were both the same length. The longer one burned out at 11.30pm and the shorter one burned out at 11pm. How long was each candle originally?</p> |  <p>Watch the TED Talk on Fibonacci Numbers. Follow Link 1 (below)</p> |  <p>Read 'The Music of the Primes' by Marcus Du Sautoy.</p> |
|  <p>Watch the TED Talk on Mathemagic. Follow Link 2 (below)</p> |  <p>Research how to solve a rubix cube – see if you can learn the algorithm.</p> |  <p>Beverly's watch gains 30 minutes every hour, whilst Jason's watch loses 30 minutes every hour. At midnight, they both set their watches to the correct time of 12 o'clock. What is the correct time when their two watches next agree?</p> |
|  <p>Undertake a Virtual Tour of the National Museum of Computing. Follow Link 3 (below)</p> |  <p>Create your own Flexagon. Follow Link 4 (below)</p> |  <p>In this multiplication each letter represents a different digit between 0 and 9. Solve for F, G, H, J and K.</p> $\begin{array}{r} F \ G \ H \ J \ K \\ X \quad \quad \quad 4 \\ \hline K \ J \ H \ G \ F \end{array}$ |
|  <p>Read 'Chaos' by James Gleick.</p> |   <p>The diagram shows a rectangular box. The areas of the faces are 3, 12 and 25 square centimetres. What is the volume of the box? If the areas of the faces are p, q and r, what is the volume of the box in terms of p, q and r?</p> |  <p>Jay and Joy are peeling potatoes for a dinner party, and they each start with the same number of potatoes to peel. Every minute, each of them peels two potatoes, and Jay sneakily throws one of his unpeeled potatoes on Joy's pile. After 10 minutes, Joy has three times as many potatoes still to peel as Jay. How many potatoes did each of them have to start with?</p> |

Links to websites used in this Super-Curricular Pre-GCSE Activities sheet:

Link 1: https://www.ted.com/talks/arthur_benjamin_the_magic_of_fibonacci_numbers#t-51141

Link 2: https://www.ted.com/talks/arthur_benjamin_a_performance_of_mathemagic

Link 3: <https://www.tnmoc.org/3d-virtual-tour>

Link 4: <http://www.murderousmaths.co.uk/games/flex/flexmake.htm>

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|  | Reading task |  | Creative task |  | Watching task |  | Student-led task |
|  | Research task |  | Writing task |  | Listening task |  | Trip or visit |