

# The Scottish Mathematical Council

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## MATHEMATICAL CHALLENGE 2015-2016

Entries must be the unaided efforts of individual pupils.

Solutions must include explanations and answers without explanation will be given no credit.

Do not feel that you must hand in answers to all the questions.

CURRENT AND RECENT SPONSORS OF MATHEMATICAL CHALLENGE ARE

*The Edinburgh Mathematical Society, The Maxwell Foundation, Professor L E Fraenkel,*

*The London Mathematical Society and The Scottish International Education Trust.*

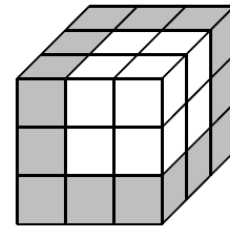
The Scottish Mathematical Council is indebted to the above for their generous support and gratefully acknowledges financial and other assistance from schools, universities and education authorities.

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### Primary Division: Problems I

- P1.1.** A snowman, which some children made on a wintry Saturday morning, remained intact for the first three days. On the fourth day the weather became milder and it lost one tenth of its bulk. The following day it lost one ninth of what remained, the next day one eighth of what remained, and so on. However, one day the sun shone so brightly the snowman lost one fifth of its *original* bulk and disappeared, leaving no trace. On which day of the week did it finally disappear? **Explain your reasoning.**

- P1.2.** The solid large cube in the diagram is made up from individual smaller cubes. The individual small cubes were all originally white until some faces were painted grey as shown. What is the largest possible number of completely white cubes?



- P1.3.** Tessa was practising subtraction. After doing a calculation correctly, she copied it into her notebook but was distracted and instead of writing down each figure, she wrote either the figure one higher or the figure one lower in the sequence 0, 1, ..., 9. What she wrote down was

$$\begin{array}{r} 2910 \\ -1497 \\ \hline 2106 \end{array}$$

Find the correct figures, explaining how you worked it out.

**END OF PROBLEM SET I**