The Scottish Mathematical Council

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MATHEMATICAL CHALLENGE 2018−2019

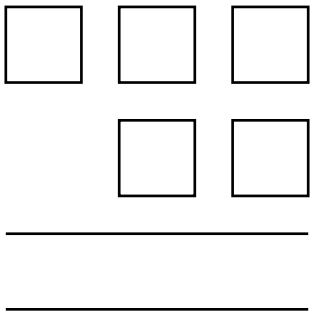
Entries must be the unaided efforts of individual pupils.
Solutions must include explanations and answers without explanation will be given no credit.
Do not feel that you must hand in answers to all the questions.

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.
Particular thanks are due to the Universities of Aberdeen, Edinburgh, Glasgow, Heriot Watt, St Andrews, Stirling, Strathclyde and to George Heriot's School, Gryffe High School and Kelvinside Academy.

Primary Division: Problems III

P3.1. One of the stories in circulation at the moment is a cautionary tale. A few years ago, a local man fearing an imminent financial crisis left his job in the bank and set up an eco-fruit farm. He began well but knew little of either crop rotation or the science of fertilising. The result was that each year his crop was 25% less than in the previous year. The fall between 2007 and 2008 was 64 kg. What was his crop in 2011? **Explain**.

P3.2. Each of the digits 2, 3, 5, 7 and 8 is placed one to a box in the diagram.



(a) If the two-digit number is subtracted from the three digit number, what is the smallest possible difference?

(b) If the three-digit number is multiplied by the two-digit number, what is the smallest possible product?

P3.3. A jeweller makes sets of small cubes out of solid silver. The jeweller has gold-plated none, some, or all of the faces on some of the cubes. The cubes in a set are all different, and no other cube can be added to the set. How many cubes are there in a set?

END OF PROBLEM SET III