NEWTON'S LAW OF COOLING PROJECT 2010

EXAMINERS' REPORT

Only 5 schools entered the competition in Group G, for GCSE students, year 11, or equivalent in Scotland, and 9 schools entered the competition in Group A for A2 and AS students, years 12 and 13, or equivalent in Scotland. This is a sad reflection on the of experimental 'prowess' of students in the UK's 6,000 secondary schools compared with the large numbers of students entering the theoretical competitions. We considered that no project had been performed sufficiently well to be awarded a Gold Medal Award. However there were some outstanding projects in the Silver Medal Award category and praiseworthy projects in the other categories.

I hope you will communicate the list of faults below available to all students who tackled the experiment.

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The experimental measurements were carried out satisfactory, within the accuracy of measuring instruments, but the subsequent analysis of the data had one or more of the following faults:

1 The measured gradients did not make use the full extent of the graph paper, and so did not obtain the accuracy that was justified from their data.

2 The use of Log, instead of Ln, function was applied.

3 The $G - (T - T_R)$ and $F - t$ straight line graphs *must* go through the origin. Many reports failed to satisfy this condition.

3 Measurements were only accurate, typically, to two or three significant figures, however some students gave many more significant figures; some with 10 or more figures!

5 Measurements of anomalous results were not repeated.

6 The ratio (A/B), obtained experimentally, should be equal to unity, within the accuracy of experimental errors .

7 Students did not appreciate, from the accuracy of their measurements, that the A_h - (1/h) graph was not a straight line . Some students did not include the result for $h = 0$ in the graph.