
Senior Physics Challenge - March 2021

Revised: the numbers of students and percentages in Table 1 have been corrected (columns 1 & 2). The grade boundaries remain the same)

This is the first time we have run this online competition for the Lower Sixth year group. The previous paper exam has the advantage of developing students' problem solving skills. This multiple choice competition looks for quick thinking and fluency in a range of small topic areas questioned. There are a number of puzzle like questions which require the students to do small manipulations and at speed. There were 40 question in an hour, and this would have been a challenge. This is in part to counter the temptation to look things up online, as that would detract from the time available. A public exam, which would have many similar questions to this, would certainly not expect such a pace from students.

Candidates were at school or at home for this event. It appeared to be well managed and it is important that students treat it with integrity in order to see how there physics skills compare with others across the country. It has the great advantage that the results do not have the impact of a public exam.

The average score was 20.0 / 40 and the standard deviation 6.0.

Results

About **5270 students** participated from **380 schools**, which was most encouraging. The competition could certainly have been made easier with fewer and simpler questions, but the BPhO is here to push students and encourage them to aim high in their physics, allowing them to participate in a national competition taken by the most able physicists of their own age in the country. They are participating in an open competition without the concern about a bad result following them around.

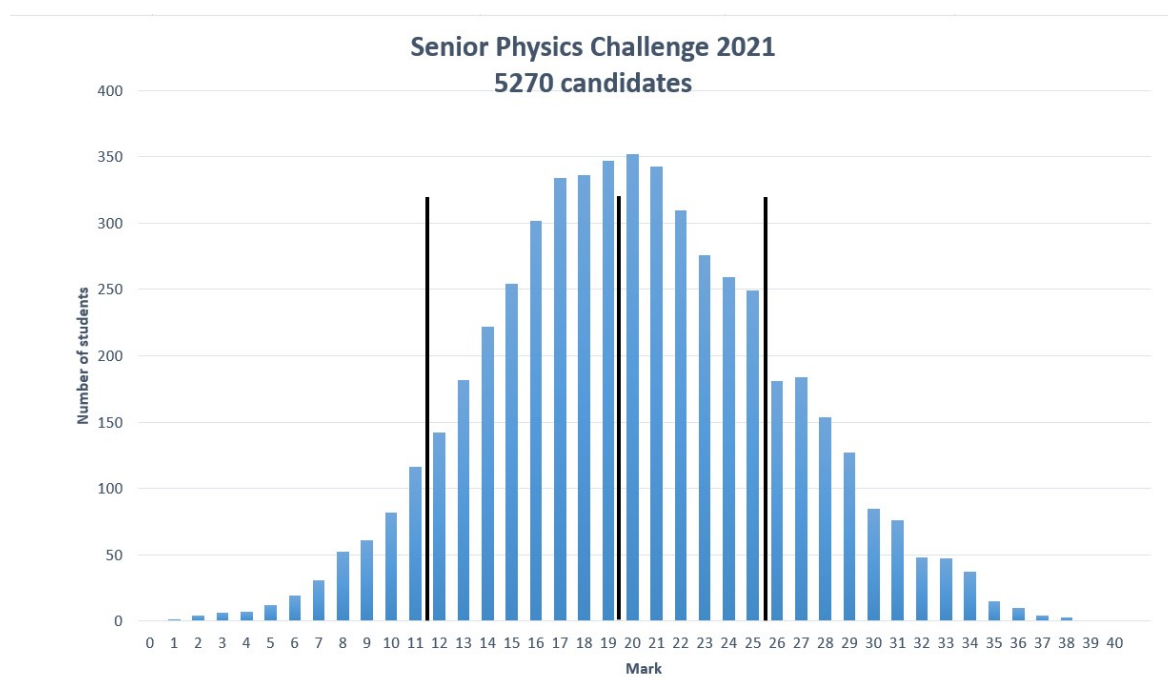


Figure 1. Distribution of marks for the two papers.

Table 1. Revised table for percentages and student numbers for each award.

Award	Percentage of entry	Number of students	Award boundaries
Gold	18.4 %	971	26 – 40
Silver	33.9 %	1789	20 – 25
Bronze	40.2 %	2119	12 – 19
Commendation	7.4 %	391	0 – 11
TOTALS	100 %	5270	

Results for the two papers:

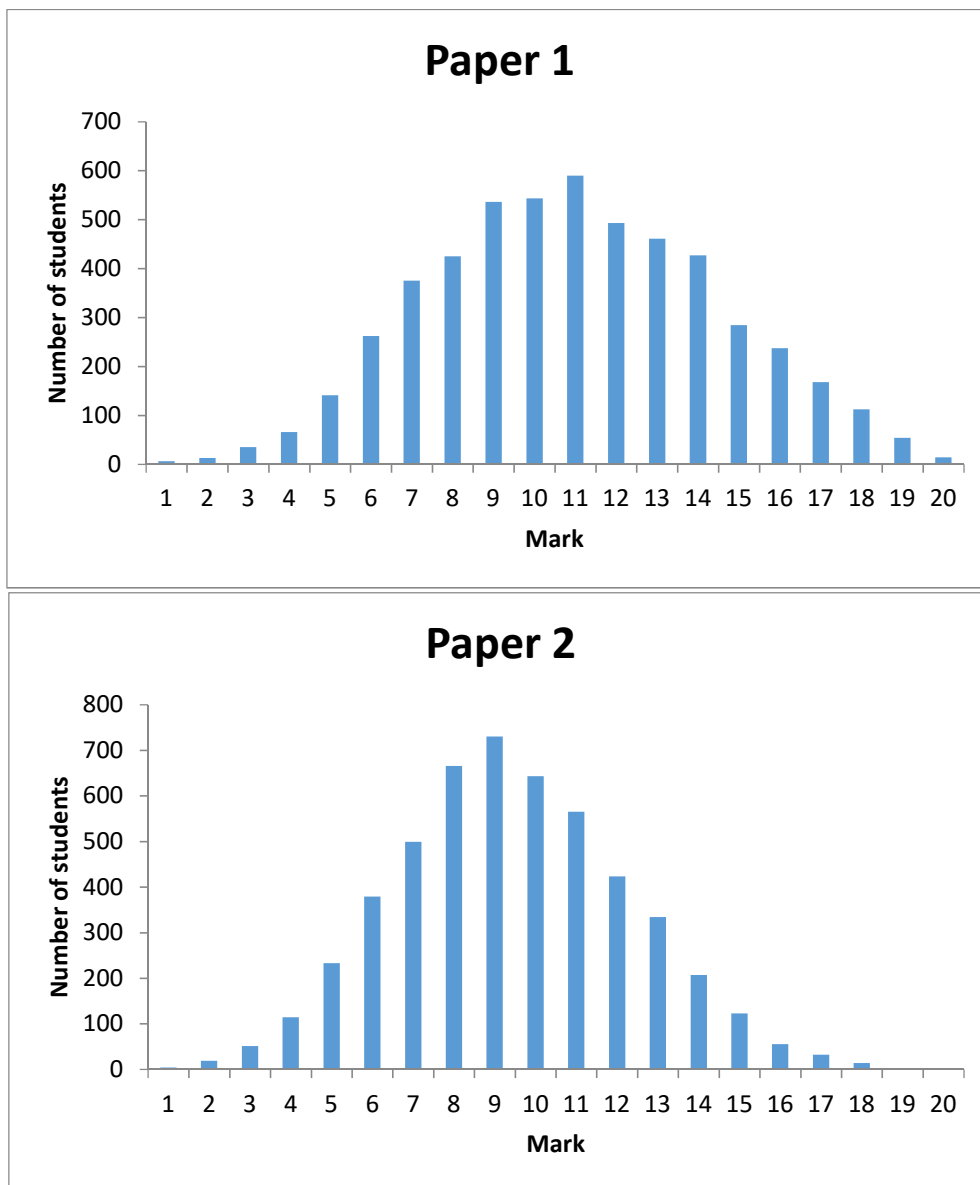


Figure 2. Mark distributions for Paper 1 and for Paper 2.

It is not evident for the questions that Paper 2 was much harder, although one can always read this into it with hindsight. But experience shows that it is very difficult to predict which students will find harder. But as they had the same time for each, it may reflect a falling off of their thinking as they flag towards the end.

The numbers of entries from schools will have very much depended on circumstances.

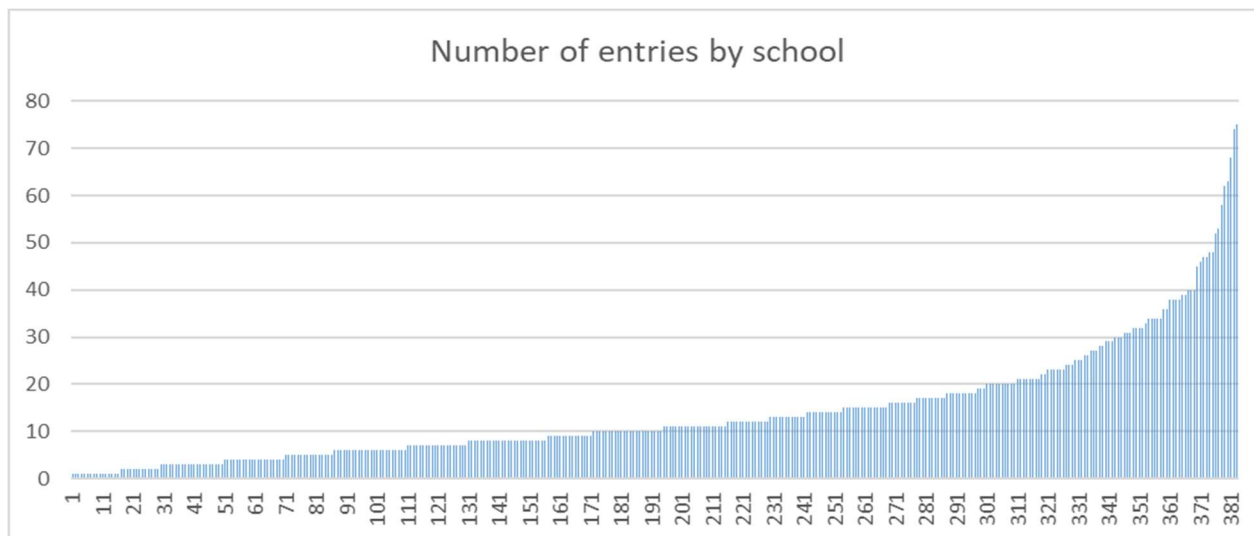


Figure 3. Number of candidates entered by a school, ranked.

Allocating awards

Please allocate the award based on the mark obtained by your student and write the award on the students' certificates. The certificates are sent with this report. In some cases you will have to combine two accounts for a single student.

Whether your students have done well on this occasion or not, please encourage them to continue problem solving, and to appreciate their success in a paper taken by many of the top achieving students in the country.

General comments

The difficulties that have arisen are in sending emails to schools. Several hundred have been sent out successfully, using the email addresses supplied from the online shop. These are not always correct. So subsequent information does not arrive and there is then some kerfuffle in liaising with schools about logins. The arrangements will be changed so that you will expect an email from the shop when you order and that will then give you a link to enter your data. Please do so with some degree of accuracy. If you wonder why we do not send out the link directly, it is because we have many students trying to get hold of papers and also companies overseas, and this is why we require school email addresses, which are clearly a nuisance. The logins (and papers) are sent out at the last minute, again to avoid cheating. It is not a suspicion but a fact.

Zeros in the papers have been removed; these occur when a student's internet fails, or they have a second account for the second paper due to a lost password.

The (Biology platform) software does not record the M/F entry.

Conclusion

The online competition has been an innovation; we do wish to retain the Paper version, given the different skill that it develops. However, we would be interested in knowing whether this online multiple choice competition would be of interest to teachers next year, when we do hope that schools will be back to normal.

If you have an opinion you are welcome to write in, or even contribute question or two.

Thank you for entering your students, when we realise that you are under a great deal of pressure to organise many different aspects of your students' lives at school.

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Appendix

Results table

Mark	No of students	Mark	No of students
1	1	21	343
2	4	22	310
3	6	23	276
4	7	24	259
5	12	25	249
6	19	26	181
7	31	27	184
8	52	28	154
9	61	29	127
10	82	30	85
11	116	31	76
12	142	32	48
13	182	33	47
14	222	34	37
15	254	35	15
16	302	36	10
17	334	37	4
18	336	38	3
19	347	39	0
20	352	40	0