



JUNIOR CERTIFICATE EXAMINATION

2001

SCIENCE AND SCIENCE – LOCAL STUDIES

HIGHER AND ORDINARY LEVELS

CHIEF EXAMINER'S REPORT SCIENCE

1. INTRODUCTION

The examination in Science consists of a written paper which is marked out of a total of 360 marks. There are five sections in the paper. At Higher level candidates must attempt all questions in Section A, one question from each of Sections B, C and D, and two questions from Section E. At Ordinary level candidates must attempt Section A and two questions from each of any three of the remaining four sections.

The total number of candidates taking Science in the 2001 Junior Certificate examination was 50 578. This figure represented 83.7% of the total cohort. Of the total number of candidates taking Science, 30 784 (60.9%) took the subject at Higher level and 19 794 (39.1%) took it at Ordinary level. The numbers taking the subject at Higher and Ordinary levels in 2001 and in the previous two years are given in Table 1.

Table 1: Numbers of candidates taking Science at Higher and Ordinary levels in each year

Year	Total Number	Higher level		Ordinary level	
		Number	Percentage	Number	Percentage
1999	52605	34367	65.3	18238	34.7
2000	51145	33226	65.0	17919	35.0
2001	50578	30784	60.9	19794	39.1

2. PERFORMANCE OF CANDIDATES

HIGHER LEVEL

The number of candidates taking the Higher level paper in Science in 2001 was 30 784. The distribution of grades awarded is shown in Table 2.

Table 2: Numbers and percentages of candidates achieving each grade in Higher level Science in 2001

	A	B	C	D	E	F	NG	Total
Number	4554	9260	9707	5690	1313	237	23	30784
Percentage	14.8	30.1	31.5	18.5	4.3	0.8	0.1	

The grades achieved by candidates in the years 1999-2001 are outlined in Table A1 in the Appendix. The grade distribution for 2001 is shifted somewhat towards the higher grades compared with previous years. This may be attributable to the significantly lower percentage of candidates taking the Higher level paper in 2001 compared with the previous years (see Table 1).

The performance of candidates and the popularity of questions are shown in Table 3. The performance of candidates is given as the average percentage mark per question, while popularity is given as the percentage of candidates attempting each question. The rank order of questions is given in each case, except that a rank order of popularity is not given for Questions 1-3 as these are compulsory. Data in this table are based on a random sample of 1760 scripts, approximately 6% of the total.

Table 3: Performance of candidates and popularity of questions in Higher level Science in 2001

Section	Question No.	PERFORMANCE		POPULARITY	
		Average Mark per Question(%)	Rank Order	Attempts(%)	Rank Order
A	1	62.7	8	100	n/a
	2	68.7	3	99.9	n/a
	3	80.2	1	99.9	n/a
B	4	76.3	2	90.7	1
	5	50.3	13	16.9	10
C	6	53.5	11	86.4	2
	7	46.4	14	18.6	9
D	8	65.3	5	38.5	6
	9	65.4	4	73.8	4
E	10	54.7	10	35.6	7
	11	36.3	15	5.2	12
	12	64.2	6	47.4	5
	13	51.9	12	75.3	3
	14	55.2	9	14.9	11
	15	63.0	7	27.7	8

ORDINARY LEVEL

The number of candidates taking the Ordinary level paper in Science in 2001 was 19 794. The distribution of grades awarded is shown in Table 4.

Table 4: Numbers and percentages of candidates achieving each grade in Ordinary level Science in 2001

	A	B	C	D	E	F	NG	Total
Number	1515	7436	7506	2849	414	69	5	19794
Percentage	7.7	37.6	37.9	14.4	2.1	0.3	0.0	

The grades achieved by candidates in the years 1999-2001 are outlined in Table A2 in the Appendix. The grade distribution for 2001 is shifted somewhat towards the higher grades compared with 2000. This may be attributable to the significantly higher percentage of candidates taking the Ordinary level paper in 2001 compared with the previous year (see Table 1). The grade distribution in 2000 was, in turn, shifted towards the higher grades compared with 1999. This is attributable to the introduction in 2000 of a wholly completion-type paper which proved more accessible to candidates.

The performance of candidates and the popularity of questions are shown in Table 5. The performance of candidates is given as the average percentage mark per question, while popularity is given as the percentage of candidates attempting each question. The rank order of questions is given in each case, except that a rank order of popularity is not given for Questions 1, which is compulsory. Data in this table are based on a random sample of 760 scripts, approximately 4% of the total.

Table 5: Performance of candidates and popularity of questions in Ordinary level Science in 2001

Section	Question No.	PERFORMANCE		POPULARITY	
		Average Mark per Question(%)	Rank Order	Attempts(%)	Rank Order
A	1	79.8	1	100.0	n/a
B	2	41.1	9	91.3	2
	3	47.2	8	85.3	7
	4	60.0	3	91.2	3
C	5	58.2	4	90.9	4
	6	40.8	10	85.4	6
	7	36.5	11	79.3	9
D	8	72.1	2	98.3	1
	9	50.3	6	86.6	5
	10	34.5	13	67.1	11
E	11	25.1	14	61.2	12
	12	35.7	12	46.4	13
	13	52.9	5	77.0	10
	14	50.0	7	79.5	8
	15	24.0	15	40.9	14
	16	12.2	16	29.1	15

3. ANALYSIS OF PAPERS

HIGHER LEVEL

Section A

Q.1 **Average mark 62.7%** **Attempts 100%**

- (a) Many locations were given for the fulcrum of the pliers.
- (c) Many candidates had difficulty in giving a reason for the pressure cooker being faster. This proved a testing question.
- (f) A variety of answers were presented for the force. Candidates did manage to get marks, however, for reference to 'rockets'.

Q.2 **Average mark 68.7%** **Attempts 99.9%**

- (a) A wide variety of gases were named here.
- (b) This question was generally well answered. However, there was a tendency for the substance to be named before the solvent, causing marks to be lost.
- (f) Most candidates got three marks for this question by linking 'corrosion' to 'metals'.
- (i) This question was well answered in general. However, many substances were suggested that would cool water by virtue of their being at a lower temperature, which was not the intention of the question.

- (j) This question generally scored full marks, with a wide variety of correct uses for carbon dioxide being given.

Q.3 **Average mark 80.2%** **Attempts 99.9%**

- (a) This part, together with part (c), was greatly assisted by good quality diagrams, with most candidates getting full marks.
- (e) This question tested the observational skills of the candidate, and in most cases was answered well.
- (f) Many candidates lost marks in this question for failing to name the organisms involved.
- (j) Examples of competition were well known by most candidates.

SECTION B PHYSICS

Q.4 **Average mark 76.3%** **Attempts 90.7%**

This was the most popular of the optional questions. It was the second highest scoring question overall and the highest scoring of the optional questions.

- (a) The graph was well constructed, conforming to the requirements of the question. Most candidates got the correct solution to the two uses of the graph.
- (b) This part was also well answered, perhaps the only difficulty being with the definition of temperature; 'temperature' was often confused with 'heat'. 'Changes to a body when heated' was interpreted by some as referring to the human body, leading to answers like 'sweating'. This question was perceived by the candidates to be considerably easier than Q.5.

Q.5 **Average mark 50.3%** **Attempts 16.9%**

This question was by far the less popular and less well answered of the two physics questions.

- (a) This part on magnetism was well answered. The small number of candidates who attempted this question scored highly on this part of the question.
- (b) Some candidates had difficulty giving the terms to describe each of the observations. Many of the candidates who attempted this question were not aware of the relative sizes of the wavelengths in the electromagnetic spectrum.

SECTION C CHEMISTRY

Q.6 **Average mark 53.5%** **Attempts 86.4%**

This question was by far the more popular of the chemistry questions. It was also somewhat better answered than Q.7. However, the two chemistry questions were among the lower scoring questions on the paper.

- (a) The sub-division of this question into four separate parts, supported by a diagram, made this part of the question very attractive for the candidates. In general this part was well answered.
- (b) 'Treatment of water' was also well answered; the sub-division of the question appeared to help candidates here.

- (c) The distinction between 'temporary hardness' and 'permanent hardness' was answered well, but naming a compound that causes temporary hardness proved much more challenging.

Q.7 **Average mark 46.4%** **Attempts 18.6%**

This was the second lowest scoring question overall.

- (a) Most candidates did not understand the concept of oxidation as used in this question. Many had difficulty explaining how copper is plated onto the surface.
- (b) While many candidates could present chemical equations, getting full marks for the balanced equation proved more difficult. The laboratory test for carbon dioxide was well answered.
- (c) Many candidates were unaware that the order in which elements are listed in the periodic table is based on atomic number.

SECTION D BIOLOGY

Q.8 **Average mark 65.3%** **Attempts 38.5%**

This was the less popular of the two biology questions. Scoring on the two biology questions was very similar.

- (a) Identifying the parts of the eye presented little difficulty for most candidates. The diagram proved extremely helpful.
- (b) Some candidates were unaware that the 'release of chemicals' referred to hormones.
- (c) 'Respiration' was reasonably well answered. While the common method of showing that heat is produced in respiration is using a plant, e.g., peas, many candidates presented alternatives involving animals.

Q.9 **Average mark 65.4%** **Attempts 73.8%**

This was the more popular of the biology questions and the fourth most popular of all the optional questions. However, the average mark awarded was very similar to that awarded to the previous question. The diagrams in this question proved very helpful to candidates.

- (a) The explanations of 'photosynthesis' were of a high standard. With each part leading onto the next, candidates were able to answer them in a logical order and in many cases accumulated full marks.
- (b) The items on the structure of the flower asking for the identification of various parts was well answered.

SECTION E APPLIED SCIENCE

Q.10 Earth Science **Average mark 54.7%** **Attempts 35.6%**

The question on Earth Science was the third most popular question in the Applied Science section. This question was attempted by 35.6% of candidates, down from 45.1% last year. There was a tendency for candidates to attempt all three parts of this question.

- (a) Some candidates had difficulty describing a neap tide but diagrams, where given, were generally accurate. The three planets had to be in line to warrant marks.
- (b) The information required on the weather station was known by most candidates.
- (c) 'Fog formation' has always created difficulties for candidates and this year was no exception.

Q.11 Horticulture

Average mark 36.3%

Attempts 5.2%

As in previous years, this was the least popular question in Section E and also the least popular overall. Only 5.2% of candidates attempted this question in contrast with an attempt rate of 75% for Q.13, the most popular question in Section E.

- (a) As many elements were acceptable on the marking scheme candidates tended to score well in this part.
- (b) This part was highly structured and candidates found it easy to answer each component of the question. Reasons for grafting were not always clear.
- (c) Answers on 'grasses' were often confused. The question on a mulch, however, was well answered.

Q.12 Materials Science

Average mark 64.2%

Attempts 47.4%

This question was the second most popular question in Section E. It was the highest scoring question in the section.

- (a) Identification of the materials used in a 13 A plug was generally correct, the material of the fuse casing being the occasional exception.
- (b) The choice of materials in this part of the question contributed to candidates scoring full marks in many cases.

Q.13 Food

Average mark 51.9%

Attempts 75.3%

This question was once again the most popular question in Section E. As in Q.10, many candidates attempted all three parts of this question.

- (a) The information about protein was well presented, with many candidates getting the full eighteen marks.
- (b) The making of silage in the laboratory is something that many candidates would appear not to have engaged in. Candidates tended to lose marks for not referring to sealing the container or to packing the grass tightly.
- (c) 'Biotechnology' can be difficult to describe and many candidates lost three marks here. This part of the question was otherwise well answered.

Q.14 Electronics

Average mark 55.2%

Attempts 14.9%

This was the second least popular question in Section E and also of all the optional questions. However, with 14.9% of candidates attempting the question this year, it was somewhat more popular than last year, when only 11.4% of candidates attempted it.

- (a) While candidates generally understood the term 'variable resistor', some experienced difficulty in drawing an appropriate circuit containing this component.
- (b) This part was generally well answered.

Q.15 Energy Conversions Average mark 63.0%

Attempts 27.7%

This was the second highest scoring question in Section E.

- (a) This part was well answered.
- (b) Candidates made good use of the vocabulary provided on the diagram for their explanation of how the electric bell works.

ORDINARY LEVEL

Section A

Q.1

Average mark 79.8%

Attempts 100%

The standard of answering in this question was very high; the average mark of 79.8% represents almost 32% of the total marks available for the whole paper. Most candidates attempted all 15 parts.

- (a) Candidates' knowledge of the apparatus, e.g., the graduated cylinder, was often disappointing.
- (b) The reason for 'no life on other planets' was often unknown, otherwise this part was well answered.
- (c) Most candidates scored well on this part, but many confused the poles of the magnet and many were not able to communicate the idea of 'repel' and 'attract'. The uses given for the magnet were often too general.
- (d) This part was reasonably well answered, although many had difficulty with the use of the thermometer, often omitting references to the human body.
- (e) This part was generally well answered, although there was some confusion between 'conduction' and 'condensation'.
- (f) Most candidates were awarded at least six marks in this part, but 'harmful', 'toxic' and 'corrosive' were often confused.
- (g) Again, most candidates were awarded at least six marks, but 'aluminium' and 'neon' were often confused.
- (h) This part was generally well answered, although 'fuel' was frequently not known.
- (i) Answering of this part was only fair.
- (j) The 'test for carbon dioxide' was rarely fully correct.
- (k) Answers to this part ranged from good to fair. 'B' was often referred to as 'the root'.
- (l) This part was well answered. The only item that caused some difficulty was the final one, where some candidates gave 'ligaments' instead of 'muscles' or 'tendons'.
- (m) Almost all candidates got full marks in this part.
- (n) This part was generally well answered. The most common wrong answers were 'the root makes food for the plant' and 'the root gives food to the plant'.

- (o) Attempts in this part ranged from very good to poor. Many candidates had difficulty with 'characteristics'.

SECTION B PHYSICS

Q.2 **Average mark 41.1%** **Attempts 91.3%**

This was the most popular question in this section and the second most popular of all the optional questions. However, it was the lowest scoring question in this section and only ninth highest scoring of sixteen overall.

- (a) This part was generally well answered.
- (b) This part was poorly answered. There was confusion between where friction was 'useful' and 'not useful'. Examples of forces were often not known.
- (c) Attempts at this part were generally poor, with answers being frequently incorrect.

Q.3 **Average mark 47.2%** **Attempts 85.3%**

This was the least popular question in this section and only seventh most popular overall.

- (a) Most candidates were awarded at least six marks in this part. There was some confusion between the units of power and of current.
- (b) Items one and two were well answered. The calculation caused problems for many candidates.
- (c) This part was generally well answered.

Q.4 **Average mark 60.0%** **Attempts 91.2%**

This was the highest scoring question in this section and third highest scoring overall. It was also the third most popular of the optional questions.

- (a) This part was generally well answered. However, 'forms of energy' was often confused with 'sources of energy'.
- (b) Most candidates scored high marks in this part.
- (c) Most candidates scored some marks here but the different colours were often confused. 'Dispersion of light' was occasionally confused with 'seed dispersal'.

SECTION C CHEMISTRY

Q.5 **Average mark 58.2%** **Attempts 90.9%**

This question was the most popular in this section and the fourth most popular of the optional questions. It was also the best answered question in this section and the fourth best answered overall.

- (a) This part was generally well answered, although 'sodium' and 'nitrogen' were occasionally confused.
- (b) This part was poorly answered. The separation technique was not named and the condenser was either not named or was incorrectly named.

- (c) The experiment in this part was the best answered of all the experiments on the paper.

Q.6

Average mark 40.8%

Attempts 85.4%

This was the second most popular question, and also the second best scoring question, in this section.

- (a) Item (i) in this part was well answered, although some candidates gave 'sulphur' or 'dioxide' only. The 'harmful effect of acid rain' was well answered, but 'measuring the pH' caused problems; the most commonly named method was using litmus.
- (b) Most answers here were very poor. Very few candidates knew either 'the elements in water' or 'surface tension'.
- (c) This part was generally well answered.

Q.7**Average mark 36.5%****Attempts 79.3%**

This was the lowest scoring question, and also the least popular question, in this section.

- (a) This part was very poorly answered. The most common wrong answer was 'alloy wheels'.
- (b) Again, this was poorly answered, although most answers merited some marks. Methods of preventing rusting were often linked to the question, i.e., using boiled water or calcium chloride.
- (c) This part was well answered by a small number of candidates. Most either did not recognise the process at all or confused it with rusting.

SECTION D BIOLOGY**Q.8****Average mark 72.1%****Attempts 98.3%**

This was the best answered question in this section and the second best answered overall. It was the most popular of all the optional questions.

- (a) Almost every candidate scored marks here. 'Bread' was occasionally given for 'protein'.
- (b) This part was well known, apart from 'function of large intestine'.
- (c) Most candidates achieved high marks in this part.

Q.9**Average mark 50.3%****Attempts 86.6%**

This was second highest scoring question in this section and also the second most popular.

- (a) This part was generally well answered, although some candidates misread the question and gave 'flower' for 'part A' and 'leaf' instead of 'sepal'. All candidates who attempted this question were awarded six marks for item (ii).
- (b) Attempts in this part were generally poor. Many candidates were unable to name 'phototropism'.
- (c) Most candidates scored well on this part.

Q.10**Average mark 34.5%****Attempts 67.1%**

This was the lowest scoring question in this section and the fourth lowest scoring overall. It was also the least popular question in the section and was the fifth least popular of the optional questions.

- (a) Many candidates gave 'cell wall' for 'part B'. Differences between cells were often linked to differences between plants and animals. Answers to 'function of part A' were often vague.
- (b) The items relating to a habitat were poorly answered. 'Water pollution' was much better known.
- (c) The 'quadrat' and its function were very poorly known. The 'pooter' and its function were much better known.

SECTION E APPLIED SCIENCE

Q.11 Earth Science Average mark 25.1% Attempts 61.2%

This question was generally poorly attempted. It was the third lowest scoring question in the section and in the paper overall.

- (a) Most candidates were unable to identify the different types of cloud.
- (b) All items in this part were equally poorly attempted.
- (c) This experiment was usually not attempted but, when attempted, it was poorly described.

Q.12 Horticulture Average mark 35.7% Attempts 46.4%

- (a) This was the best answered part of the question.
- (b) Answers to this part were very vague and contained little information.
- (c) Descriptions of this experiment were generally poor.

Q.13 Materials Science Average mark 52.9% Attempts 77.0%

This was the second most popular question in this section and was the highest scoring question in the section.

- (a) This part was generally well answered, although there was some confusion between 'cotton' and 'nylon'.
- (b) Many candidates simply drew a circle, others drew a tumble drier.
- (c)

Plastics	This item was rarely attempted, and attempts were usually poor.
Textiles	'Fibres' and 'fabrics' were often confused. The experiment, when attempted, was usually well described.
Metals	This item was rarely attempted but was usually well answered when chosen. The experiment was sometimes confused with the experiment to compare the bending strength of two pieces of timber.
Timber	This was the most popular item of the four items in this part of the question. It was usually well answered.

Q.14 Food Average mark 50.0% Attempts 79.5%

This was the most popular question, and the second highest scoring question, in this section.

- (a) Almost all candidates scored twelve marks in this part.
- (b) Most items in this part, with the exception of 'reducing sugars', were well attempted.

- (c) Most candidates were awarded three marks for 'churning'. However, very few managed to accumulate any further marks.

Q.15 Electronics**Average mark 24.0%****Attempts 40.9%**

This was the second lowest scoring question in this section and also on the paper overall. It was also the second least popular question in the section and the second least popular of all the optional questions.

- (a) This item was poorly attempted.
- (b) There was little evidence that candidates were familiar with this topic.
- (c) A few candidates scored well in this item; most did not.

Q.16 Energy Conversions Average mark 12.2%**Attempts 29.1%**

This was the lowest scoring, and also the least popular, question on the paper.

- (a) Very few candidates were able to give even one of the examples requested.
- (b) Correct answers to this item were rare.
- (c) A small number of candidates were familiar with this experiment and scored well on this item. However, most answers merited few marks.

4. GENERAL COMMENTS***HIGHER LEVEL***

This paper was very well received and well answered by many candidates. The questions in Section C, the chemistry questions, continued to be among the lower scoring questions. However, the difference was not as marked as in some previous years. This may have been due the more structured nature of the questions on this year's paper.

In each of Sections B, C and D, one question was very much more popular than the other one. The more popular questions were Q.4, Q.6 and Q.9, respectively. In the case of the first two, approximately five times as many candidates attempted the question as attempted the alternative. In Section D, the imbalance in favour of Q.9 was almost two to one. However, the average marks did not reflect these imbalances to nearly the same extent. Indeed, the average marks for the two questions in Section D were almost identical (see Table 3). This suggests that the questions were of a similar level of difficulty and that candidates are devoting more attention to some areas of the course than to others. In the applied science section, Q.13 (Food) continues to be by far the most popular question. This probably reflects the overlap between this section and the biology section and also the Home Economics course.

At Higher level relatively few candidates attempted more than the required number of questions in each section. If one adds, for example, the percentages of candidates attempting the physics questions (Q.4 and Q.5) one obtains 107.6% (see Table 3). The corresponding figures for the chemistry and biology sections are 105.1% and 112.3%, respectively. The figure for the applied science section, in which candidates were required to answer two questions, was 206.2%. While this calculation does not take into account the number of candidates who did not attempt the required number of questions it is a clear indication that only a small percentage of candidates attempted more than the required number of questions in each section.

ORDINARY LEVEL

The general standard of answering on this year's paper was very good and this was reflected in the high percentage of candidates achieving a Grade C or better and the small percentage of candidates who obtained E, F and NG grades.

The introduction of a wholly completion-type paper in 2000 has been widely welcomed and has resulted in very significant improvements in the grades obtained by candidates. The structured nature of the questions and the more limited amount of reading required are seen to encourage candidates to attempt questions which they might otherwise ignore.

An analysis of Table 5 shows that most Ordinary level candidates attempted considerably more than the required number of questions. If one adds, for example, the percentages of candidates attempting the physics questions (Q.2, Q.3 and Q.4) one obtains 267.8%. Since candidates were required to answer two questions in this section, this figure shows that at least 67.8% of candidates answered more than the required number of questions in this section. The corresponding figures for the chemistry, biology and applied science sections are 255.7%, 252.0% and 334.1%, respectively. Since, in addition to being required to answer only two questions from each section, candidates were required to answer questions from only three of the four sections, it is clear that most candidates attempted significantly more than the required number of questions. A further analysis of the random sample of 760 scripts in fact showed that some 94% of candidates attempted more than the required number of questions and that 16% of candidates attempted all sixteen questions on the paper.

While the overall improvement in performance is to be welcomed some concern remains about the standard of answering on questions relating to practical work. Candidates tended to score low marks on items requiring descriptions of experiments. Similarly, many candidates had difficulty identifying pieces of apparatus, e.g., the graduated cylinder in Q.1(a) and the quadrat and pooter in Q.10(c). This suggests that many candidates are not devoting sufficient time to appropriate practical work.

5. RECOMMENDATIONS FOR TEACHERS AND STUDENTS

Higher level candidates need to ensure that they attempt the required number of questions. Furthermore, they need to ensure that they answer all the parts of the questions that they do attempt. Higher level candidates in particular should also be encouraged to complete the required number of questions in each section before attempting additional questions.

Student practical work is an essential part of the Junior Certificate Science course and this is reflected in the examination papers. Students need to devote an adequate amount of time to appropriate laboratory work and field work. Not only will this allow them to become familiar with the required skills and procedures but it will also help to develop their knowledge and understanding of the subject.

Candidates should be encouraged to devote some time to reading and considering a question before composing an answer. Higher level candidates should ensure that the numbering of their answers to Sections B, C, D and E corresponds to the numbering on the examination paper.

Teachers are advised to devote appropriate periods of time to each area of the course so that students may be familiar with all aspects of the subject.

SCIENCE – LOCAL STUDIES

1. INTRODUCTION

The examination in Science – Local Studies consists of a written paper, which is marked out of a total of 288 marks, and a practical project. At Higher level the written paper consists of four sections and accounts for 80% of the total marks; candidates must attempt all questions in Section A and one question from each of Sections B, C and D. At Ordinary level the written paper consists of five sections and accounts for 67.7% of the total marks; candidates must attempt Section A and two question from each of any two of the remaining four sections.

The total number of candidates taking Science – Local Studies in the 2001 Junior Certificate examination was 1303. This figure represented 2.5% of the total number of taking science in the Junior Certificate examination. Of the total number of candidates taking Science – Local Studies, 381 (29.2%) took the subject at Higher level and 922 (70.8%) took it at Ordinary level. The numbers taking the subject at Higher and Ordinary levels in 2001 and the previous two years are given in Table 6.

Table 6: Numbers of candidates taking Science – Local Studies at Higher and Ordinary levels in each year

Year	Total Number	Higher level		Ordinary level	
		Number	Percentage	Number	Percentage
1999	1782	585	32.8	1197	67.2
2000	1653	576	34.8	1077	65.2
2001	1303	381	29.2	922	70.8

2. PERFORMANCE OF CANDIDATES

HIGHER LEVEL

The number of candidates taking the Higher level paper in Science – Local Studies in 2001 was 381. The distribution of grades awarded is shown in Table 7.

Table 7: Numbers and percentages of candidates achieving each grade in Higher level Science – Local Studies in 2001

	A	B	C	D	E	F	NG	Total
Number	32	129	139	77	3	1	0	381
Percentage	8.4	33.9	36.5	20.2	0.8	0.3	0.0	

The grades achieved by candidates in the years 1999-2001 are outlined in Table A3 in the Appendix. The grade distribution for 2001 is shifted somewhat towards the higher grades compared with previous years. This may be attributable to the significantly lower percentage of candidates taking the Higher level paper in 2001 compared with the previous years (see Table 6). The reducing proportion of the total cohort taking the subject may also be a contributory factor.

ORDINARY LEVEL

The number of candidates taking the Ordinary level paper in Science – Local Studies in 2001 was 922. The distribution of grades awarded is shown in Table 8.

Table 8: Numbers and percentages of candidates achieving each grade in Ordinary level Science – Local Studies in 2001

	A	B	C	D	E	F	NG	Total
Number	58	296	364	150	50	4	0	922
Percentage	6.3	32.1	39.5	16.3	5.4	0.4	0.0	

The grades achieved by candidates in the years 1999-2001 are outlined in Table A4 in the Appendix. The grade distribution for 2001 is broadly in line with previous years.

PROJECT ASSESSMENT

The project is assessed towards the end of the school year. In the course of the assessment each candidate is interviewed by an external examiner. The project accounts for 20% of the total available marks at Higher level and 33.3% of the available marks at Ordinary level. The results of the project assessment are combined with those of the written examination to produce an overall result.

A number of students (90 or 6.7%) who were entered for the examination did not obtain a result in the project assessment. This number included those who transferred to Science (12 or 0.9%), those who had left school before the assessment (31 or 2.3%) and those who presented neither project for assessment nor themselves for interview (47 or 3.5%). A further 31 students (2.3%) either presented themselves for interview without a project or presented a project but did not turn up for interview.

The percentage distribution of grades awarded at Higher and Ordinary levels in the project assessment in 2001 is shown in Table 9.

Table 9: Percentages of candidates achieving each grade at Higher and Ordinary level for projects in Science – Local Studies 2001

	A	B	C	D	E	F	NG
Higher level	52.2	31.5	12.3	3.9	0.0	0.0	0.0
Ordinary level	21.0	35.5	23.9	15.5	3.2	0.7	0.2

Table 9 shows that all Higher level candidates achieved a grade D or better, while almost 96% of Ordinary level candidates did so. These figures reflect the satisfactory extent to which assessment objectives were met in the projects presented.

3. ANALYSIS OF PAPERS

The questions on the Science – Local Studies examination papers are the same as those on the Science papers. Accordingly, a separate analysis of the questions for those candidates taking the Science – Local Studies papers has not been carried out.

4. GENERAL COMMENTS

A number of projects lacked sufficient investigative practical work. Teachers need to be aware that the emphasis in the project is on this type of work, and direct their students accordingly. While background research is an essential part of any good project it should not be allowed to distract from the fundamental activity of investigative practical work.

There is considerable evidence that students are not giving due recognition to the importance of maintaining a diary. The diary is a fundamental part of the project. The purpose of the diary is to provide a dated record of all activities carried out by the student in the course of developing the project. As such, it clearly cannot be composed when the project is complete. In the case of group projects, all members of the group should keep individual diaries.

A project of this nature requires an extended period of time for its execution if it is to be brought to a successful conclusion. There is evidence that some students are not seriously addressing the work of the project until late in the final year of the junior cycle.

5. RECOMMENDATIONS FOR TEACHERS AND STUDENTS

The diary is a fundamental part of the project and must be kept as a contemporaneous record of all work carried out by the student in relation to the project.

Work on the project should begin as early as possible. Teachers need to provide guidance and support to students throughout the course of the project on the progress and direction of the work as well as the content.

The primary emphasis of the project needs to be on investigative practical work. With this in mind, students should seek to achieve a balance between background research and planning, practical investigation, presentation of results and conclusions.

Ideally, the topic chosen for a project should be one in which the student has a particular interest.

APPENDIX

Science Higher Level

Table A1: Grade distributions in Higher level Science for years 1999-2001

1999	A	B	C	D	E	F	NG	TOTAL
Total	5402	9627	9848	7038	2041	390	21	34367
%Total	15.7	28.0	28.7	20.5	5.9	1.1	0.1	
Total Female	3061	5154	4929	3353	898	150	5	17550
% Female	17.4	29.4	28.1	19.1	5.1	0.9	0.0	
Total Male	2341	4473	4919	3685	1143	240	16	16817
% Male	13.9	26.6	29.3	21.9	6.8	1.4	0.1	

2000	A	B	C	D	E	F	NG	TOTAL
Total	5496	8453	9328	7037	2329	540	43	33226
%Total	16.5	25.4	28.1	21.2	7.0	1.6	0.1	
Total Female	3343	4537	4597	3128	952	228	13	16798
% Female	19.9	27.0	27.4	18.6	5.7	1.4	0.1	
Total Male	2153	3916	4731	3909	1377	312	30	16428
% Male	13.1	23.8	28.8	23.8	8.4	1.9	0.2	

2001	A	B	C	D	E	F	NG	TOTAL
Total	4554	9260	9707	5690	1313	237	23	30784
%Total	14.8	30.1	31.5	18.5	4.3	0.8	0.1	
Total Female	2663	4990	4788	2710	557	110	4	15822
% Female	16.8	31.5	30.3	17.1	3.5	0.7	0.0	
Total Male	1891	4270	4919	2980	756	127	19	14962
% Male	12.6	28.5	32.9	19.9	5.1	0.8	0.1	

Science Ordinary Level

Table A2: Grade distributions in Ordinary level Science for years 1999-2001

1999	A	B	C	D	E	F	NG	TOTAL
Total	448	3652	7169	5090	1419	426	34	18238
%Total	2.5	20.0	39.3	27.9	7.8	2.3	0.2	
Total Female	229	1650	2789	1842	509	103	9	7131
% Female	3.2	23.1	39.1	25.8	7.1	1.4	0.1	
Total Male	219	2002	4380	3248	910	323	25	11107
% Male	2.0	18.0	39.4	29.2	8.2	2.9	0.2	

2000	A	B	C	D	E	F	NG	TOTAL
Total	1392	5836	6595	3331	642	114	9	17919
%Total	7.8	32.6	36.8	18.6	3.6	0.6	0.1	
Total Female	613	2306	2589	1361	242	31	2	7144
% Female	8.6	32.3	36.2	19.1	3.4	0.4	0.0	
Total Male	779	3530	4006	1970	400	83	7	10775
% Male	7.2	32.8	37.2	18.3	3.7	0.8	0.1	

2001	A	B	C	D	E	F	NG	TOTAL
Total	1515	7436	7506	2849	414	69	5	19794
%Total	7.7	37.6	37.9	14.4	2.1	0.3	0.0	
Total Female	713	3174	2912	1050	148	17	0	8014
% Female	8.9	39.6	36.3	13.1	1.8	0.2	0.0	
Total Male	802	4262	4594	1799	266	52	5	11780
% Male	6.8	36.2	39.0	15.3	2.3	0.4	0.0	

Science – Local Studies Higher Level

**Table A3: Grade distributions in Higher level Science – Local Studies
for years 1999-2001**

1999	A	B	C	D	E	F	NG	TOTAL
Total	34	163	204	142	31	11	0	585
%Total	5.8	27.9	34.9	24.3	5.3	1.9	0.0	
Total Female	23	78	102	65	14	4	0	286
% Female	8.0	27.3	35.7	22.7	4.9	1.4	0.0	
Total Male	11	85	102	77	17	7	0	299
% Male	3.7	28.4	34.1	25.8	5.7	2.3	0.0	

2000	A	B	C	D	E	F	NG	TOTAL
Total	70	154	199	120	28	5	0	576
%Total	12.2	26.7	34.5	20.8	4.9	0.9	0.0	
Total Female	38	99	111	62	17	4	0	331
% Female	11.5	29.9	33.5	18.7	5.1	1.2	0.0	
Total Male	32	55	88	58	11	1	0	245
% Male	13.1	22.4	35.9	23.7	4.5	0.4	0.0	

2001	A	B	C	D	E	F	NG	TOTAL
Total	32	129	139	77	3	1	0	381
%Total	8.4	33.9	36.5	20.2	0.8	0.3	0.0	
Total Female	25	74	70	47	2	0	0	218
% Female	11.5	33.9	32.1	21.6	0.9	0.0	0.0	
Total Male	7	55	69	30	1	1	0	163
% Male	4.3	33.7	42.3	18.4	0.6	0.6	0.0	

Science – Local Studies Ordinary Level

**Table A4: Grade distributions in Ordinary level Science – Local Studies
for years 1999-2001**

1999	A	B	C	D	E	F	NG	TOTAL
Total	26	321	480	300	52	16	2	1197
%Total	2.2	26.8	40.1	25.1	4.3	1.3	0.2	
Total Female	10	122	172	102	17	3	0	426
% Female	2.3	28.6	40.4	23.9	4.0	0.7	0.0	
Total Male	16	199	308	198	35	13	2	771
% Male	2.1	25.8	39.9	25.7	4.5	1.7	0.3	

2000	A	B	C	D	E	F	NG	TOTAL
Total	64	336	411	217	42	6	1	1077
%Total	5.9	31.2	38.2	20.1	3.9	0.6	0.1	
Total Female	33	125	157	72	18	4	1	410
% Female	8.0	30.5	38.3	17.6	4.4	1.0	0.2	
Total Male	31	211	254	145	24	2	0	667
% Male	4.6	31.6	38.1	21.7	3.6	0.3	0.0	

2001	A	B	C	D	E	F	NG	TOTAL
Total	58	296	364	150	50	4	0	922
%Total	6.3	32.1	39.5	16.3	5.4	0.4	0.0	
Total Female	17	93	111	64	21	1	0	307
% Female	5.5	30.3	36.2	20.8	6.8	0.3	0.0	
Total Male	41	203	253	86	29	3	0	615
% Male	6.7	33.0	41.1	14.0	4.7	0.5	0.0	

Summary statistics for Science and Science – Local Studies combined

**Table A5: Grade distributions (%) in Science and Science – Local Studies
combined
for years 1999-2001**

Level	Year	Total	A	B	C	D	E	F	NG
Higher	1999	34 952	15.6	28.0	28.8	20.5	5.9	1.1	0.1
	2000	33 802	16.5	25.5	28.2	21.2	7.0	1.6	0.1
	2001	31 165	14.7	30.1	31.6	18.5	4.2	0.8	0.1
Ordinary	1999	19 435	2.4	20.4	39.4	27.7	7.6	2.3	0.2
	2000	18 996	7.7	32.5	36.9	18.7	3.6	0.6	0.1
	2001	20 716	7.6	37.3	38.0	14.5	2.2	0.4	0.0