An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Science and Biology
REPORT

Ballinamore Post-Primary Schools
Ballinamore, County Leitrim
Roll number: 63460P

Date of inspection: 26 November 2010
REPORT ON THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND BIOLOGY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Ballinamore Post-Primary Schools. It presents the findings of an evaluation of the quality of teaching and learning in Science and Biology and makes recommendations for the further development of the teaching of these subjects in the school. The evaluation was conducted over one day during which the inspector visited classrooms and observed teaching and learning. The inspector interacted with students and teachers, examined students’ work, and had discussions with the teachers. The inspector reviewed school planning documentation and teachers’ written preparation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal and subject teachers. The board of management was given an opportunity to comment in writing on the findings and recommendations of the report; a response was not received from the board.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

Ballinamore Post-Primary Schools are a combination of two schools, namely Fatima and St Felims Secondary School and Ballinamore Vocational School. The schools are distributed over three sites in the town and encompass a junior school, a senior school and a practical subjects building. Application has been made to the Department of Education and Skills for a new single site school and this is currently at ‘application to tender’ stage in the Public Private Partnership (PPP) initiative.

Science is a core subject at junior-cycle level. Students in the junior cycle generally have a base classroom and move to the laboratory for their science classes when necessary. A fire in one part of the school, in January 2010, resulted in the loss of one of the science laboratories as well as the staffroom and a number of other classrooms. This area has now been renovated. The science team has gone to great lengths to organise materials and equipment in the new laboratory to ensure its readiness for use.

Approximately eighty-seven percent of students take at least one science subject at senior-cycle level in the school. Timetabling of the sciences is generally appropriate. Numbers in some of the science classes are high, namely first year and third year Science as well as fourth year Biology. The average number of students in these classes is thirty. In the interests of health and safety in practical classes, management should look again at how they allocate students to classes in these option blocks in order to reduce the numbers.

The science team consists of three qualified science teachers. Teachers are allocated to classes on a rotational basis and continuity of teacher through the junior cycle and senior cycle is good. Management encourages and facilitates continuing professional development (CPD). A number of in-service courses have been attended in both Junior Certificate science and senior-cycle biology in Carrick-on-Shannon Education Centre. One teacher is a facilitator with the Agricultural Science support service. New teachers are inducted by the principal and mentored by a more senior science teacher.
There are two laboratories in the school. Appropriate Health and Safety equipment was observed in both laboratories including fire extinguishers, fire blankets and first aid kits. The recently refurbished laboratory is spacious, bright and clean while the second laboratory is older but fit for purpose. Both laboratories have good information communications technology (ICT) facilities. One laboratory is equipped with an interactive white board while the second laboratory has a laptop, data projector and screen. Both laboratories are broadband internet enabled.

There is a small preparation area in which chemicals are organised using the colour coded scheme recommended by the Chemistry Support Service. Flammables are appropriately housed, however, toxic and corrosive chemicals are stored on open shelves in this area. Management is advised to secure appropriate, custom-built cupboards for both toxic and corrosive chemicals. A code of conduct for the laboratory is displayed clearly in both laboratories and appropriate accident reporting procedures are in place.

**PLANNING AND PREPARATION**

Subject department meetings, which are facilitated by management, are held on a monthly basis. Minutes of these meetings are recorded and were available at the time of the inspection. A co-ordinator has been appointed and this position is rotated among the science team on an annual basis. The role of the co-ordinator includes chairing meetings, monitoring the implementation of the subject plan, co-ordination of science examinations, organising in-house speakers and science promotional events. The role of science co-ordinator also involves liaison with the special needs co-ordinator, guidance counsellor and other subject co-ordinators.

Subject department planning documents, including programmes of work for Junior Certificate Science and Leaving Certificate Biology were provided. It is noteworthy that the programmes of work are monitored and reviewed on a termly basis with regard to sequence of topics, student progress and resources required. A good level of cross-curricular planning was referenced which included subjects such as History, Geography, Home Economics and English.

A good quality and detailed programme of work was provided for each year group. It would be useful to students if they were provided with an overall list of topics, at the start of the year, to facilitate them in their planning and revision. An appropriate timeframe was included and it is good to note that the programmes included syllabus-based learning outcomes, linked to appropriate resources and modes of assessment. A list of methodologies was included in the planning documentation. This could be more useful to the science team if the methodologies were linked to the learning outcomes indicated in the programmes of work. It is recommended that the science team discuss and share their active teaching and learning methodologies and include them in the overall programme of work for each year group.

An audit of chemicals and equipment is carried out at the end of the school year on an annual basis. This is good practice.

A range of co-curricular activities is used to promote the sciences in the school. During science week earlier this year, the teachers of science organised a science quiz, a samba workshop and a presentation on ecology and oak tree growing in the school. Students attend the BT Young Science and Technology exhibition each year. This year the school had nine entries for the competition and two have been accepted for exhibition in January 2011. Students are also
encouraged to enter for competitions such as the Young Environmentalist and Science Snaps competition as well as Green Flag events.

**TEACHING AND LEARNING**

Lessons began with a roll call followed by correction of homework from the previous lesson. A number of resources were used to enhance teaching and learning and these included the use of worksheets, posters, laboratory apparatus, textbooks and the data projector. Very effective practice was observed in one lesson on electricity where students worked, in pre-assigned groups, to wire a three-pin plug. Each student had the opportunity to carry out the activity and it is commendable that the lesson was reinforced through the use of an animation clip using the data projector. This lesson followed on from a homework exercise where students were asked to carry out a number of calculations on a household electricity bill. The corrections were carried out at the start of the lesson and there was good emphasis placed on the use of appropriate units of measurement and numeracy.

Classroom management was effective in all classrooms visited and students responded positively to clear class rules and teachers’ instructions. Teachers regularly checked that learning was taking place through questioning and the assignment of short tasks. Questioning strategies were varied and appropriate to the lesson content. They included directed and open-ended questions. Some higher-order questioning was also used to promote critical and analytical skills and further use of this methodology is recommended. Teachers encouraged students to listen to each other and chorus answering was discouraged immediately. Questioning was also effectively used in summarising and recapitulation at the end of the lessons.

Students displayed a mature attitude to their learning and the majority showed good understanding of the concepts and facts taught. Instruction in all lessons was clear and particular attention was paid to encouraging the use of subject-specific language.

A range of methodologies was incorporated into the lessons and teachers tried to maintain a good balance between teacher instruction and student activity. The inclusion of peer tutoring and paired work could be included in some lessons in order to further engage students in their own learning. Good use was made of PowerPoint presentations to check students’ learning in the labelling of diagrams, in clarifying the lesson content and in displaying photomicrographs.

The atmosphere in all lessons observed was positive and conducive to work. This helped to promote a secure and supportive learning environment. Students’ participation in all classroom activities was closely monitored by the teacher. Attention was given to the learning needs of individual students as well as to general communication with the class group.

In the practical lessons observed, appropriate health and safety regulations were adhered to and students generally displayed good routines for setting up and clearing away apparatus. The development of such routines is good preparation for practical activities and it can help to ensure good management of time in lessons. In the majority of lessons, the students worked in pre-assigned teams. Teachers encouraged an investigative approach where practicable.

Good practice was observed where the teacher encouraged discussion of the results of the experiment and the suitability of the methodology at the end of the lesson. This provided a thorough summary to consolidate learning. All teachers should be mindful of the pace of their lessons in order to incorporate time for students to clear away their apparatus and equipment before the end of the class period.
To enhance the good practice evident in lesson planning and delivery, it is recommended that, in all classes, the lesson objectives be shared explicitly with the students at the outset and that these outcomes be revisited and discussed at the end of each lesson.

**ASSESSMENT**

A range of assessment activities is utilised by the science team. Formative assessment practices include questioning, homework, experiments, projects, checking of exercise book work and observation of student activities.

Summative assessments also take place. Teachers set end of unit tests while common Christmas and summer tests are also held. Certificate examination students take “mock” examinations in the early spring. Other forms of assessment include coursework investigations and mandatory experiments.

Results of the in-house examinations are conveyed to parents in school reports. Formal communication with parents also takes place at the parent-teacher meetings while regular informal contact is via the students’ homework journal which parents are encouraged to monitor and sign.

During the evaluation, a range of mandatory practical notebooks, class work notebooks and homework exercise books was observed. The notebooks reviewed displayed a range of abilities, which generally reflected the mixed ability nature of the classes observed. Some notebooks were maintained to a high standard and were checked and annotated regularly. It is important that students look after their mandatory practical books and notebooks. Teachers should regularly encourage students to keep their records up to date. The science team allocates a percentage in the end of year tests for the standard of the practical books and this is good practice. Homework tasks were generally assigned at the end of the class and most homework exercises were corrected in class the next day. It is recommended that the Science team consider the development of common correcting practices and put in place some procedure for follow-up on corrections and comments made in all notebooks.

**SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- Science is a core subject at junior-cycle level.
- The school has two laboratories, both of which have good information communications technology (ICT) facilities.
- A good quality and detailed programme of work was provided for each year group.
- The atmosphere in all lessons was positive and conducive to work.
- A range of co-curricular activities are used to promote the sciences in the school.
- Classroom management was effective and students responded positively to clear class rules and teachers’ instructions in all classrooms visited.

As a means of building on these strengths and to address areas for development, the following key recommendations are made:
• Management is advised to secure appropriate custom-built cupboards for both toxic and corrosive chemicals.
• In the interests of health and safety in practical classes, management should look again at how they allocate students to classes in these option blocks in order to reduce the numbers.
• It is recommended that the science team discuss and share their active teaching and learning methodologies and include them in the overall programme of work for each year group.
• To enhance the good practice evident in lesson planning and delivery, it is recommended that lesson objectives be shared explicitly with the students at the outset and that these objectives be revisited and discussed at the end of each lesson.

Post-evaluation meetings were held with the teachers of Science and Biology and with the principal at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

Published March 2011