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ABSTRACT

This document contains a summary of the policies adopted by the Association for Science Education (ASE). These policies are applicable to teachers of science at all levels in all formal places of learning in Great Britain. Summaries of policy statements pertaining to quality in science education, a flowchart that provides an overview of these policies, the place of science in a balanced curriculum, values and science education, initial teacher education, continuing professional development, science technicians, learning and teaching, assessment, class size, information and communication technologies, the public understanding of science, environmental education, instructional design and technology, governors and science education, partnerships between industry and education, science education and the community, access to science education, and gender and science education are included. (DDR)

The Association for Science Education

Summary of Policies

What the Association thinks

to help you

- *plan*
- *teach*
- *negotiate*
- *manage*

January 1998

ASE www page: http://www.ase.org.uk/

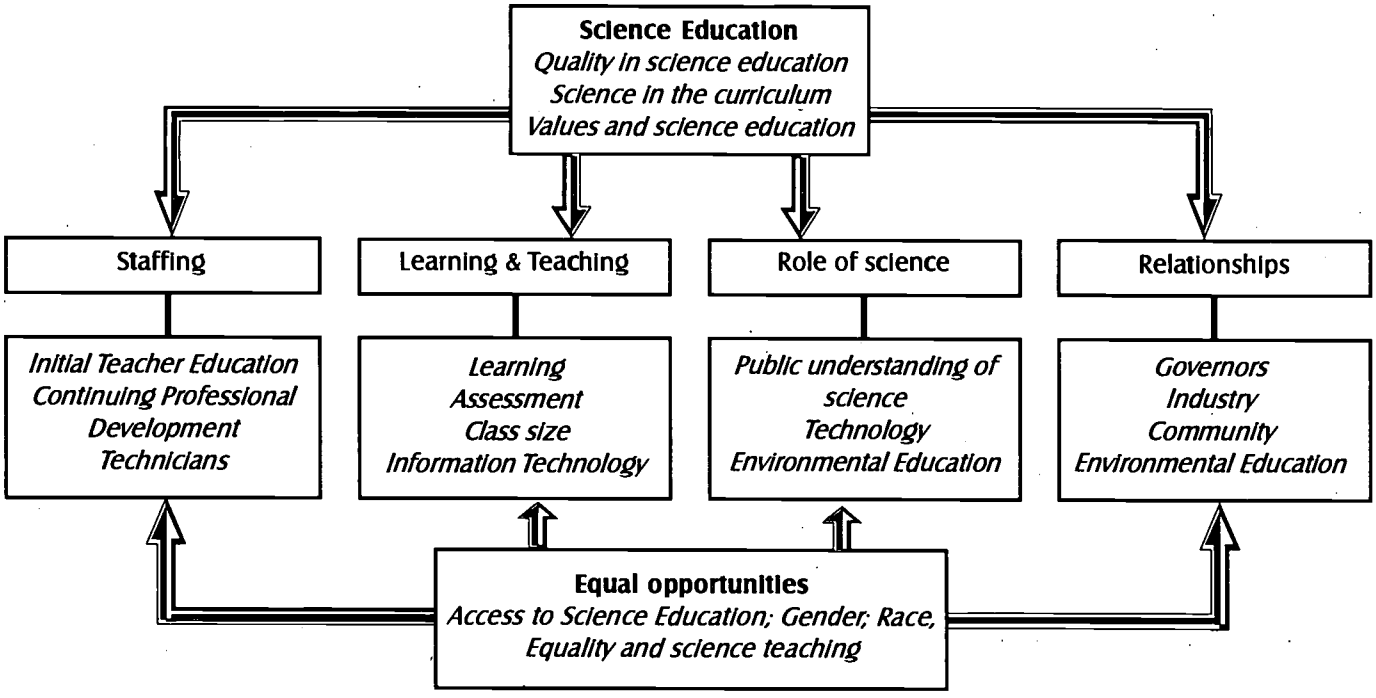
ASE POLICIES

During 1996/7 all the policy statements of the Association were reviewed. Regions, ASE committees and individual members were all involved in considering drafts of policy statements in existing and new areas. Council approved the revised set of policy statements in November 1997, after considering the consultation responses. Although these stand as current ASE policy, the process of policy formulation must be dynamic. ASE committees and Regions may recommend policies in areas yet unconsidered. Guidance Division of Council will monitor policy development and review to ensure that ASE policies reflect both the important areas of science education and views of ASE members.

This document gives all members an overview and summary of all policies. Individual policy documents are 1-2 sides of A4 in length. They are all available on the ASE's web site: http://www.ase.org.uk. Alternatively, you can receive the full policy document for any particular area, by sending an A4 s.a.e. to John Lawrence at ASE Headquarters, indicating the relevant area(s).

Mary Ratcliffe **Immediate Past Chair**

POLICY OVERVIEW



The policies apply across the UK. 'Teachers of science' is used throughout to cover all who teach science from early years to HE. The term learners is used to encompass learners of all ages. Institution is used throughout to denote any formal place of learning. This includes primary, middle, special, & secondary schools; sixth form, FE and HE colleges. Headteacher is used to cover principals in post-16 institutions as well as headteachers of schools. Governing Bodies includes School Boards.

SCIENCE EDUCATION

Quality in Science Education

The Association is committed to high quality science education in all institutions. The Association believes that there are many features which contribute to high quality learning in science, including challenging and interesting learning activities which support development of skills in science, knowledge and understanding of science and attitudes towards science.

The Association believes that there are some important features which contribute to high quality teaching including enthusiasm, sound subject knowledge, good pedagogical content knowledge and, fundamentally, the ability to provide the circumstances for high quality learning.

The Association considers that high quality teaching is best supported by appropriate curriculum frameworks which reflect the purposes of science education in development of attitudes, skills, knowledge and understanding.

The Association recognises that high quality teaching of science is also dependent on the availability of: high quality and appropriate resources; effective technical and teaching support staff for all phases of education; manageable and appropriate class sizes; professional and practical support from colleagues and through continuing professional development.

There are many ways to recognise quality, including the use of internal and external assessment and inspections. The Association believes that a range of measures is likely to produce a more useful description of quality than a single method.

The Place of Science in a Balanced Curriculum

The Association believes that the curriculum should be based upon the modes of language and communication, mathematics, social studies, technological activities, creative and aesthetic activities and religious and moral education in addition to scientific studies, thus ensuring a broad and balanced curriculum.

The Association believes that a child's experience of science should start in the primary school within a broad, integrated curriculum. The Association believes that around 10% of the time in the primary curriculum should be spent on science. The science curriculum in the early years of secondary education must build on the primary curriculum in a continuous and progressive manner. The Association believes that, in the early years of the secondary curriculum, science is likely to be a separate subject area within the curriculum and should constitute between 10 and 15% of curriculum time. The science curriculum in primary and lower secondary should have a balance of content across the disciplines of biology, chemistry and physics along with other areas such as astronomy and earth science.

It is recognised that science knowledge is developing at a rapid rate. A balance of breadth and depth of scientific knowledge and understanding must be maintained, in addition to the development of problem solving, investigative skills and informed attitudes. The Association believes that learners should spend a minimum of 20% of curriculum time on the study of science between the ages of 14 and 16 in order to achieve breadth and depth in each area of science education.

In preparing learners for the 21st century, the Association believes in working towards universal scientific capability; maximum access to courses in science beyond the age of 16 and lifelong learning in science.

Values and Science Education

The Association considers that the goals of science education should make explicit reference to values. Assessment strategies and evaluation of learning concerned with values should be consistent with a values approach. Within their own belief framework, teachers of science should uphold values of integrity, responsibility to learners and other teachers, and respect for the proper conduct of science. The ethos of the institution should encourage the same values in learners. Learners should be given opportunities to appreciate:

- the nature and conduct of science
- science's interrelationship with other disciplines in providing societal and cultural values
- that the conduct of science is not value-free but that some guiding values apply
- that science has its limitations and cannot always provide clear-cut answers, particularly at the boundaries of scientific knowledge.

Learners should experience a relevant science curriculum, which puts an understanding of the applications of science in a social and ethical context.
Learners should be encouraged to evaluate the nature of evidence from science and elsewhere in making judgements about the use of science. Teachers and learners should not shrink from tackling controversial issues in science. This is not an easy area of learning for teachers of science to manage - appropriate support materials and training should be made available to teachers.

STAFFING

Initial Teacher Education

The Association believes that initial science teacher education courses are best provided by partnerships between schools and higher education institutions, with each side of the partnership adopting the role(s) it is best placed to provide.

Initial Teacher Education programmes should:

- be closely linked with adequate induction and continuing professional development procedures in all institutions;
- prepare newly qualified teachers for first posts in a range of institutions appropriate to the particular age range for which they are qualified.

Continuing Professional Development

The Association firmly believes that all teachers of science should be entitled to high quality continuing professional development from initial teacher education onwards throughout their career.

The Association is committed to the provision of high quality of professional development opportunities within its own frameworks and in partnership with a range of other organisations.

The Association is also committed to a research-based approach to continuing professional development, principled in design, grounded in a practical approach, manageable, and aimed at achieving higher standards of learning of science.

Science Technicians

The Association recognises the importance of Science Technicians as full members of the Association.

ASE believes that:

- technicians should be considered full and valued members of a science department and take part in all departmental activities including relevant meetings;
- an appropriate training and career structure for technicians is essential. This would assist in valuing and enhancing the work of science technicians;
- appropriate technical support should be provided for all institutions;

Learning and Teaching

The Association considers that learners should experience a wide variety of teaching and learning methods in their development towards scientifically literate individuals. Teaching and learning in science should provide opportunities for learners to:

- enquire, predict and hypothesise; explore, observe, investigate and discover;
- solve problems; discriminate, judge and evaluate; clarify their ideas.

Learning and teaching methods should ensure continuity and progression in the education of the individual. This continuity should encompass the content matter, teaching methods and the development of learning skills.
Science education should encourage individuals to define their attitudes and values in conjunction with the development and application of their knowledge, skills and understanding. Learners should also develop their skills in planning, collecting and evaluating evidence.

Assessment

The Association believes that assessment should support high quality learning in science and the aims of a broad, balanced and relevant science curriculum.

Assessment is a necessary and integral part of teaching and learning. There should be a dynamic interaction between aims, objectives, curriculum planning, teaching and learning, and assessment in which each informs and helps the others to evolve and improve.

Assessment in science should:

- provide routes for progression in learning;
- support lifelong learning;
- lead to worthwhile qualifications;
- provide a basis for the making of informed decisions by users of the educational system, including policy makers.

Assessment in science should recognise the special qualities of science as both an academic and practical subject.

Class Size

The Association is committed to the achievement of a maximum class size of 20 for all science classes in which practical work is to be performed. This principle has been advocated by the Association for several years. The Association highlights the good practice which takes place in the Scottish educational system where practical class sizes have been limited for decades to a maximum of 20 in secondary schools. This maximum is imposed by law, and forms a part of teaching contracts. It is widely acknowledged in Scotland that limited class size has contributed to the sustained rise in popularity of the sciences. The Association wishes to promote this good practice in all schools in the UK.

Information and Communication Technologies

The Association considers that learners are entitled to appropriate opportunities to use IT to collect, store, retrieve and present scientific information. There should be appropriate progression from being able to use IT, to judging when to use IT to collect, handle and investigate scientific information. As information and communication technologies develop further, teachers and learners should have opportunities to use these technologies in appropriate ways to fulfill the aims of science education. For example, teachers should be able to evaluate the potential of video-conferencing, email communication and Internet access as tools for learning.

The Public Understanding of Science

The Association believes in the need to increase the public understanding of science. The world in which we live is highly technological and scientific. Citizens will increasingly need a knowledge of science if well informed judgements are to be made. The work of the Association in formal and non-formal education can help to make a difference to the overall level of Public Understanding of Science in the community.

Environmental Education

The Association recognises the special contribution of science education to environmental education. Teachers of science should assist learners in developing:

- understanding of :
  - natural processes in the environment;
  - human dependency on these;
  - ways that human activity can affect these.
- an ability to:
  - appreciate the nature of scientific evidence;
  - recognise and be critical of scientifically weak arguments;
  - evaluate uncertainty and degrees of risk;
  - engage in problem solving, research and communication.
- care and concern for living things and the environment.

The Association considers that teachers of science should support a coherent approach to Environmental Education through policies and teaching strategies involving the whole institution.

Technology: Design and Technology

The Association considers that science and technology are inextricably interwoven. It is important to foster both the natural relationship between science and technology and develop the distinctive characteristics of their component parts.

The curriculum for all learners should be planned to develop an understanding of the interrelationships between science, design & technology and mathematics.

Learners should have the opportunity to develop and apply their knowledge and understanding of scientific and technological principles and techniques.

RELATIONSHIPS

Governors and Science Education

The Association:

- supports the key role that governors have in determining the quality of science education through their responsibility for the management, administration and curricula of institutions;
- believes that effective governing leads to an open exchange of information and ideas between governors, parents, headteachers and those responsible for science education in schools and colleges;
- supports partnership between governors and those responsible for science education.

Education / Industry Partnership

As a professional organisation concerned with science education, it is important that the Association maintains a high profile in the area of industrial links and partnerships.

The Association seeks to influence and be involved in education/industry partnerships.

The Association is committed to the promotion and maintenance of contacts with industry leading to the development of r working relationships.

Science Education and the Community

The Association strongly encourages the development of a close interaction between institutions and their communities because of the benefits that this will bring to the science education of present and future generations of young people. It is essential to recognise these benefits and support key individuals who contribute significant time and effort in order to make the links and liaisons fruitful.

Science education should take advantage of and contribute to the communities in which we live. Communities include other educational institutions as well as families, industries, hospitals and community groups.

Community links can be achieved through:

- science-based activities which use community resources;
- provision of opportunities for the continuing education in science of those who have left full-time education and for the promotion of the public understanding of science;
- sharing the benefits of learners' scientific projects that have local interest;
- promotion of learners' and institutional achievements within the local community.

EQUAL OPPORTUNITIES

Access to Science Education

The Association promotes equality of access to science education for all learners.
All groups, institutions and organisations concerned with science education should have explicit written equal opportunities policies and use them effectively to guide, monitor and evaluate their practice.

Teachers of science should be aware of the physical, sensory, cognitive and emotional development and needs of learners. In setting learning objectives, a variety of science activities should be planned to meet the needs of different learners.

Planning for access to science should be addressed at three levels:

- whole institution policy;
- class schemes of work;
- group and individual activity plans.

Every learner should be offered access to science activities at an appropriate level.

The Association will itself develop good practice and procedures to monitor its own organisation at all levels in respect of equal opportunity.

Gender and Science Education

All groups, institutions and organisations concerned with science education should reinforce the importance of science education for girls and boys of all aptitudes and abilities.

Gender-stereotyping should be avoided in:

- use of teaching, learning and assessment activities;
- resources and their use;
- counselling and careers guidance;
- staff appointments and professional development.

Race, Equality and Science Teaching

The Association is committed to playing an active role in the reduction of racism and to work towards its eventual elimination, in and through science education.

The science curriculum should represent science as a cultural activity, practised in particular social, political and economic contexts. Teaching and learning activities should support this representation of science.
Teachers should encourage access to science by learners of different backgrounds by using appropriate language and a wide variety of approaches, contexts, and groupings.
Assessment methods, integral to good teaching and learning, should be selected according to fitness for purpose, paying attention to appropriate use of language.

The Association for Science Education

Your opportunity to influence the decision-makers in science education

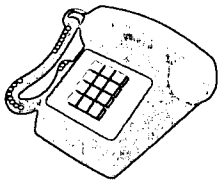
ASE is the organisation for teachers and others contributing to science education at all levels. If you teach science, if you are an adviser, technician or student or even work in industry, you can benefit from membership.

The benefits of membership include:

- ✓ Free journals - ***Education in Science*** which is sent to all members five times a year, ***Primary Science Review*** and ***ASE Primary Science*** for primary members and ***School Science Review*** for Secondary members.
- ✓ Book sales service with 10% discount on ***all*** purchases - whether for school or personal use.
- ✓ Special insurance rates and ***free*** indemnity insurance for individual UK members. Covers you for those school trips.
- ✓ An advice service to help you with problems in the classroom, for example on aspects of safety.
- ✓ The opportunity to attend the ASE Annual Meeting - the largest event of its kind in the United Kingdom.

- is a forum for the views of the membership. Its regional structure enables these views to be heard by government, education authorities and industry.
- ASE is completely independent. It receives no funding from government, is financed from members' contributions and is a registered charity.
- ASE is totally committed to the advancement of science education.
- ASE membership is open to all involved or interested in science education.
- ASE subscriptions are deductible for tax purposes.

For further details, including subscription rates, please write to:-
The Membership Manager, ASE, College Lane, Hatfield, Herts. AL10 9AA.



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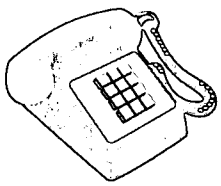

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