

Education System Information Pack for STEM Ambassadors

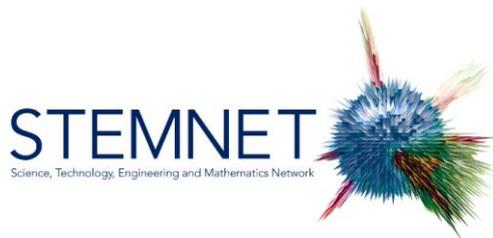
This education system information pack aims to provide all STEM Ambassadors with general guidance and information on how the schools system works across the UK and what you should be aware of as a STEM Ambassador when volunteering in schools.

We hope you find this information pack helpful. Each section can also be downloaded separately to make it easier for you to access the information as and when required to support your volunteering activities.

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Contents

Section 1 - The education system across the UK.....	2
Section 2 - How are schools and colleges organised in England?	3
Section 3 - What types of school and college are there?	5
Section 4 - What is the curriculum like in England?	7
Section 4 - What non-vocational qualifications can young people work towards?.....	11
Section 6 - What vocational qualifications that young people can work towards?.....	12
Section 7 - How are schools and colleges organised in Wales?	14
Section 8 - How are schools and colleges organised in Northern Ireland?.....	16
Section 9 - How are schools and colleges organised in Scotland?	19
Section 10 - Glossary of useful terms	23



Section 1 - The education system across the UK

We all once went to school so we all have some experience of education systems.

If you went to school in the UK, you may not be aware of the degree to which things have changed - and changed again - through the years, whether it is the curriculum; how young people are taught and how they learn; or wider aspects of school life. If you went to school elsewhere, the differences with the UK schools of today may be greater still.

The section below gives a brief overview of the education systems of the UK, and takes as its starting point the English system. Wales, Northern Ireland and Scotland are slightly different – see later sections for more information.

As with all industries, change is constant and successive UK Governments have had an influence on the system. In the most recent years, there have been considerable and fundamental changes to the local and national funding mechanisms and structures of schools, as well as to the curriculum and other aspects of education. Terminology, websites and other references provided here are subject to change.

What are the implications for STEM Ambassadors?

While it is strongly recommended that you become familiar with school and curriculum structures and terminology, you will probably need to know most about the particular school(s) that you will be working with.

The level of information you need depends on the activity. For instance, you will not need to know a great deal of information about a school if you are intending to support a one-off activity there, organised by the STEMNET Contract Holder or one of its partner organisations. However, if you are developing an ongoing relationship with a school(s) and offering support on a regular basis, it would be beneficial to understand more about the school in terms of its strengths and weaknesses, and what the pupils are studying that relates to your subject area. You can find this kind of information from a variety of sources, including your local STEMNET Contract Holder, the school's own website and recent inspection reports (sometimes found on the school's website).

Most important to remember is that each school is different to the next – so no matter which school you work with, the main source of information should be the school's STEM subject teacher(s) or senior leaders involved in setting up the STEM activities, as well as others that you meet when you visit.

Section 2 - How are schools and colleges organised in England?

For differences in Wales, Northern Ireland and Scotland, see sections 7, 8 and 9 respectively.

How do children’s ages in schools relate to the Year system?

Education is compulsory for children and young people aged between 5 and 16 years old, although there are Government plans to raise this to age 17 by 2013, and age 18 by 2015. (This could mean that 16-18 year olds would need to be in some form of education, but not necessarily schools and colleges).

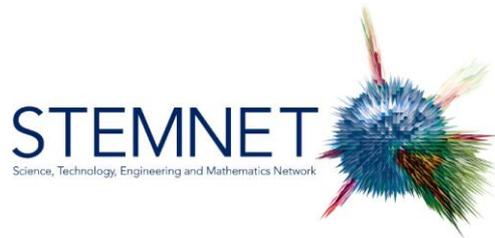
Further Education (FE) refers to education undertaken beyond compulsory education i.e. post-16. FE (or Post-16) Colleges provide further education outside of a school environment and may include Sixth form colleges which focus primarily on education for 16 to 19 year olds, usually in regions of the country where many of the schools only cater for learners up to the age of 16. Note that many secondary schools use the word ‘college’ in their title, even though they cater for both pre- and post-16 learners.

Most schools and colleges are set up to cover age-ranges as follows:

School	Year group	Age range
Primary	Foundation Stage and Year 1 – Year 6	5 or younger - 10
Secondary	Year 7 – Year 11 or Year 7 – Year 13 (with a ‘Sixth form’)	11 - 16 or 11 – 18 or 19 (with ‘Sixth form’)
Sixth form colleges	Year 12 – Year 13 (also referred to as ‘Lower and Upper Sixth form’)	17 – 18 or 19
Other: Lower, Junior, Middle, High, Upper etc.	Various	Various ages spanning the year groups in different ways
Special schools	Various	Various ages – catering for some children with various Special Educational Needs (SEN)
FE colleges	Do not use Year system	16 and older

What are the implications for STEM Ambassadors?

In most cases STEM Ambassadors will need to know the age range of the pupils with whom they will work, which teachers will usually refer to by Year group. When working with



Special schools, Ambassadors should find out in advance the range of needs the school caters for and ask about the implications of this, if any.

Section 3 - What types of school and college are there?

The organisation of schools and colleges is influenced heavily by the way they are funded.

State schools¹ (also called ‘maintained’ schools)² educate the vast majority of children, and are paid through Government taxation, although in some cases additional funding is voluntarily provided by a charitable **trust**, or **faith-based** organisation such as the Church of England:

- **Local Authority** schools are, to varying extents, supported by and held accountable to local councils across of the country, and they receive most of their central Government funding via the Local Authority.
- **Academies, City Technology Colleges** and **University Technical Colleges** are funded directly from central Government, without the influence of the Local Authority, although most have converted from Local Authority schools. In many cases they are supported or sponsored by companies, Universities or other organisations, and some are also part of a wider chain of schools run by a lead organisation. The Academy scheme was originally to re-launch schools that had faced particular difficulties, but now it is open for other schools to apply. Originally all Academies were secondary institutions, although as the number of Academies increases year on year, there are now also expected to be growing number of primary and special schools funded in this way³. **‘Free schools’** are also centrally funded state maintained schools independent of the Local Authority – but these are set up from scratch by parents, teachers or other groups.
- Other terminology sometimes used in connection with state maintained schools may relate to
 - **Selective and non-selective schools** – Most state schools do not select by pupil ability. However, there are around 160 selective state secondary schools in England (usually called Grammar schools), who select in Year 6 (at the end of Primary education) using tests. Neighbouring schools may be non-selective and will therefore cater for pupils of all abilities and aptitudes – although their intake could be affected by the presence of a selective school.
 - **‘Specialist’ schools** – This programme was set up to help schools to build on particular strengths, and establish distinctive identities to raise standards. These schools (often renamed as ‘colleges’) focused on their chosen subject area, but also had to meet National Curriculum requirements. Secondary schools in

¹ Many secondary schools use the word ‘college’ in their title, even though they cater for both pre- and post-16 learners.

² Range of state schools - go to <http://www.education.gov.uk/schools/leadership/typesofschools/>

³ Academies - go to www.ssatrust.org.uk

England applied to be designated as a specialist school in one or more of ten areas: arts, business and enterprise, engineering, humanities, languages, mathematics and computing, music, science, sports and technology. Additional funding was provided from central Government – and although funding is no longer available through this process, schools can opt to retain their specialist status⁴.

- **‘Training school’** status and funding was given to schools that successfully applied to provide some teacher training services to other schools. This system is currently being reorganised and includes the proposed introduction of a smaller number of **‘Teaching schools’**.

State schools are inspected by Ofsted (Office for Standards in Education, Children’s Services and Skills)⁵

Independent schools are not funded by the state and obtain most of their finances from fees paid by parents and income from investment. All independent schools, both day and boarding, must by law be registered with the Department for Education and, as a condition of registration and continued registration, must reach and maintain standards set out in regulations. STEMNET’s remit covers state schools, although occasionally links are made with independent schools.⁶

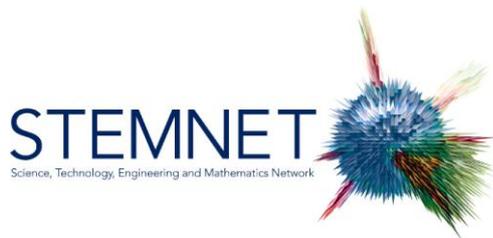
What are the implications for STEM Ambassadors?

- The broad categories of schools (such as whether the school is a Local Authority or Academy school, or if the school is faith-based) are unlikely to have much bearing on day-to-day STEM activities.
- STEM Ambassadors can assume every school has a wide range of pupil motivations, aptitudes and abilities, and should then seek more guidance from school staff – but cannot assume that all selective school pupils are more ‘academic’ or show higher ability than non-selective school pupils.
- STEM Ambassadors may be particularly interested in school specialism if this is in a STEM subject, but it might not play a major part in events once plans have been made.

⁴ Specialist school status - go to www.ssatrust.org.uk

⁵ Go to www.ofsted.gov.uk

⁶ STEMNET - go to www.stemnet.org.uk/



Section 4 - What is the curriculum like in England?

For differences in Wales, Northern Ireland and Scotland, see sections 7, 8 and 9 respectively.

Since 1988 there has been a National Curriculum for England, Wales and Northern Ireland which was originally intended to “promote the spiritual, moral, cultural, mental and physical development of pupils at the school and of society”; and “prepare such pupils for the opportunities, responsibilities and experiences of adult life”. The National Curriculum sets out

- the subjects taught
- the knowledge, skills and understanding required in each subject
- standards or attainment targets in each subject – which teachers can use to measure progress and plan the next steps in children’s learning
- how children’s progress is assessed and reported⁷

The National Curriculum currently applies to all pupils aged 5-16 in Local Authority maintained schools. It does not apply to Academies, ‘free schools’ and independent schools, although many choose to follow it. Schools are free to organise their curriculum and teaching to suit the particular needs of their learners and may introduce other activities that extend the learning experience of their pupils. They will ultimately create their own plans (such as ‘schemes of work’), term by term and year by year.

How is the curriculum structured? What subjects are included? How are they assessed?

For each National Curriculum subject, there is a **programme of study** which describes the subject knowledge, skills and understanding pupils are expected to develop. The programmes of study also map out a scale of attainment within the subject - and the different **National Curriculum levels** describe knowledge, skills and understanding children have learned as they progress. After the age of 14, levels are generally replaced by the grades used in various qualifications. School years are grouped into **Key Stages** (often abbreviated to KS), which helps define the points at which children are **assessed** so that their attainment can be reported to a wider audience and help measure overall progress in learning. Assessments are carried out using national tests (often referred to as ‘SATs’⁸), teachers’ assessments, or as part of the examinations, coursework and portfolios leading to formal qualifications.

	Year	Key Stage (KS)	Assessment information collected
Primary education	Reception	Early years	Foundation stage ‘profile’

⁷ National Curriculum - go to www.direct.gov.uk and <http://curriculum.qcda.gov.uk>

⁸ SATs = ‘Standard Assessment Tasks’ (in contrast to US where SAT = ‘Scholastic Aptitude (or Assessment) Test’)



		foundation stage	
	Year 1-2	KS1	Teacher assessments in English, maths and science
	Year 3-6	KS2	National tests and teacher assessments in English and maths Teacher assessments (with some 'sample' testing) in science
Secondary education	Year 7-9 (for some this will end in Year 8)	KS3	Teacher assessments in English, maths and science
	Year 10-11 (for some this will start in Year 9)	KS4	Most children take GCSEs or other qualifications at various times over this period
Post-16	Year 12 -13	Sixth form	A levels and other qualifications

The **subjects** of the National Curriculum are 'statutory' (i.e. compulsory) at different Key Stages, as outlined in the table below. Note that a school may well offer more than just the National Curriculum subjects – and there is particular flexibility at Key Stage 4, where diversity of provision and choice for learners begin to play a larger role.

Subject	STEM- subjects (and related)	KS1	KS2	KS3	KS4
English		x	x	x	x
Mathematics	x	X	x	x	x
Science	x	X	x	x	x
Art and design	(x)	x	x	x	
Citizenship				x	x
Design & Technology (D&T)	x	x	x	x	
Geography	(x)	x	x	x	
History		x	x	x	
Information & Communication Technology (ICT)	(x)	x	x	x	x
Modern Foreign Languages (MFL)				x	
Music		x	x	x	
Physical Education (PE)		x	x	x	x

English, mathematics, science and ICT are often referred to as ‘core’ subjects, with the others called ‘foundation’ subjects - although these terms are sometimes applied to different subject by different education organisations and schools.

Additional areas of the curriculum: Religious education is also statutory throughout the key stages, but the programme of study is not defined by the National Curriculum. At KS3 and KS4, economic wellbeing and financial capability (including careers education) and personal wellbeing (including sex and relationship, and drugs education) are added in a similar way; and at KS4 work-related learning is also included (see below).

The place of engineering: While mathematics, science, and design and technology are all STEM subjects in the National Curriculum, engineering is not specifically included. However, aspects of engineering are incorporated into design and technology; and a limited number of schools and FE colleges offer the subject to GCSE or A level, or through vocational qualifications. In some regions, there is also currently available the 14-19 Diploma in engineering.

Work-related learning (WRL) was introduced as a requirement for all KS4 pupils in 2004⁹. The introduction of WRL has helped to formalise – as well as build upon – the work experience traditionally undertaken by pupils at age 15/16, although it does not always have to be delivered in the workplace. WRL is delivered via a three-stranded approach:

- learning *through* work: pupils learn from direct experience, e.g. work experience or part-time jobs
- learning *about* work: providing opportunities for pupils to develop knowledge about work
- learning *for* work: developing skills for employability, e.g. through work simulation or mock interviews

Linked to WRL, pupils are also required to develop **enterprise** skills. Enterprise education enables pupils to develop confidence, self-reliance and a willingness to embrace change. Through participation in mini-enterprise activities, pupils practice risk management, learning from mistakes and being innovative.

The remit, structure and content of the National Curriculum is under review - with a focus in 2011-12 on English, mathematics, science and physical education; and other subjects following in 2013-2014.¹⁰ The place of WRL and enterprise education has to be determined.

⁹ Work-related Learning - go to www.education.gov.uk and search for ‘Work-related Learning’

¹⁰ Review of the National Curriculum - go to www.education.gov.uk/schools/teachingandlearning/curriculum/nationalcurriculum

***What are the implications for STEM Ambassadors?***

- Some familiarity with the Year system and Key Stages, and having a basic understanding of the curriculum taught in schools (and some of the terminology around it) will help when liaising with teachers and speaking to children.
- STEM Ambassadors may be interested to identify where their area of work is introduced to students, if at all. Ambassadors may be involved directly in curriculum-related activity, or in the wider remit of schools as they extend the learning and experiences of their pupils.
- It would not be unexpected for teachers of STEM subjects at secondary level to know a lot about their own curriculum but much less about other subject areas. The day-to-day work of teachers does not usually involve large amounts of cross-curricular activity – which may be the reason for the school to express interest in STEM Ambassadors and help make the links.
- WRL and enterprise education rarely receive specific attention, and it is here that a STEM Ambassador may be asked to help and can make a really valuable contribution to pupils' WRL requirements. A visit from an Ambassador can help pupils develop knowledge about work as many will not have had an opportunity to interact with people with experience in STEM subject beyond the classroom. They may have limited idea of what scientists, technicians, engineers etc. actually do day-to-day, and could have stereotyped or negative views.
- As most STEM-related employment involves enterprise skills, this is another angle that the STEM Ambassador can bring – especially as it is coming from people other than teachers.

Section 5 - What non-vocational qualifications can young people work towards?

GCSEs¹¹ are KS4 qualifications taken by the vast majority of children and available in many traditionally ‘academic’ subjects. Schools can vary the KS4 offer within limits. Science, for instance, can be taken as a single combined science GCSE (sometimes referred to as ‘core’ science); or as two combined science GCSEs (‘core and additional’, or ‘double’); or as biology, chemistry and physics GCSEs (often referred to as ‘triple science’ as all of the three separate sciences are taken). There are also GCSEs in ‘additional applied’ science, taken as the second GCSE alongside ‘core’ science.

Post-16 qualifications - While the majority who stay at school or college will take AS and A2 level qualifications in Year 12 and Year 13 (which together make up a full A level ¹²), other vocational qualifications are also available – see below.

Recently introduced at KS4, and subject to modification, **the English Baccalaureate** (often abbreviated to ‘EBacc’ or ‘EBac’)¹³ is not itself a qualification but instead recognises where pupils have secured a C grade or better at GCSE across a core of academic subjects – English, mathematics, history or geography, two sciences and a language. It is not yet clear whether this will become a certificated qualification in itself, or the extent to which similar courses may or may not count towards it. For example, GCSEs in applied science do not count towards the ‘two sciences’.

Other courses – The International GCSE (IGCSE) and the International Baccalaureate are also available for English schools, although until recently only independent schools had the option to offer them.

¹¹ GCSE = ‘General Certificate of Secondary Education’

¹² A level (Advanced level) = AS (Advanced subsidiary) plus A2 (usually taken in Year 13)

¹³ English Baccalaureate - go to www.education.gov.uk and search for ‘English Baccalaureate’

Section 6 - What vocational qualifications can young people work towards?

Vocational qualifications such as BTECs, City and Guilds and OCR Nationals¹⁴ are available at KS4 and post-16 and may be taken alongside, or in place of, more ‘academic’ curriculum subjects. They have a work-related emphasis; are usually assessed by assembling portfolios of evidence or coursework; and can be taken in subjects like art and design, business, health and social care, information technology, media, public services, science and sport. These qualifications vary in curriculum time that is expected, and so they may available to be equivalent in breadth to one, two or more GCSEs, for example. In terms of challenge, they can be compared as follows:

Vocational qualification level	Comparison
Entry level	Below GCSE grade G
Level 1	GCSE grade D-G
Level 2	GCSE grade A*-C
Level 3	A levels

The **14-19 Diploma**¹⁵, developed in recent years in some regions, was intended to combine academic and vocational subjects – and use classroom learning alongside more practical, hands-on experience, such as a project work; functional skills; work experience; and other skills like team work and creative thinking. Developed at Levels 1 to 3, there are currently 14 Diplomas available in some schools and colleges, including engineering; IT; construction and the built environment; society, health and development; environment and land-based studies; and manufacturing and product design. The future development of the 14-19 Diploma is now under review and it may be phased out.

Some students progress to **Higher National Certificates (HNCs)** at Level 4 and **Higher National Diplomas (HNDs)** at Level 5 in Universities and FE colleges¹⁶, in subjects like agriculture, computing and IT, construction and civil engineering, engineering, health and social care, business and management, sport and exercise sciences, performing arts, retail and distribution, and hospitality management.

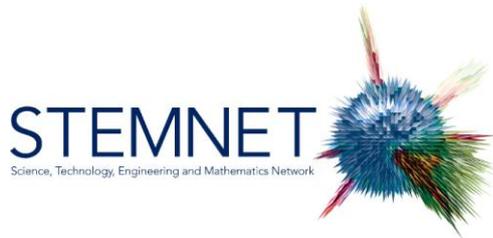
¹⁴ BTEC = ‘Business and Technical Education Council’ - go to www.edexcel.com/quals/BTEC;

City and Guilds – go to www.cityandguilds.com;

OCR Nationals – go to <http://ocrnationals.com>

¹⁵ 14-19 Diploma - go to <http://www.education.gov.uk/schools/teachingandlearning/qualifications/diploma> or www.direct.gov.uk and search for ‘14 to 19 Diplomas’

¹⁶ HNC and HND – go to www.direct.gov.uk and search for ‘HNCs and HNDs’

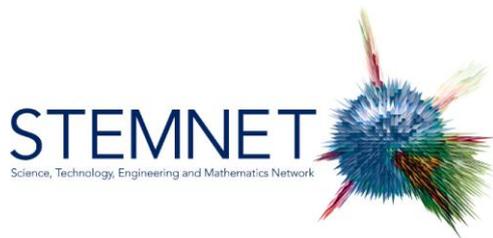


Apprenticeships, whereby learners over the age of 16 gain qualifications and experience, usually while carrying out paid work, are available in many sectors of industry and to different levels.¹⁷

What are the implications for STEM Ambassadors?

- It may be worth asking the school how the pupils access STEM subjects in different years (e.g. which pupils study triple science, vocational courses etc.); and to ask about pupils previous achievements or predicted levels or grades with regard to STEM and other subjects as a gauge of their overall ability.
- Whether pupils undertake non-vocational or vocational studies it may be worth considering how the topics with which become involved through STEM activities link with their studies in the formal curriculum. Vocational qualifications usually require studying subjects in working life – you could ask teachers how what you are doing might contribute to this.

¹⁷ Apprenticeships – go to www.apprenticeships.org.uk



Section 7 - How are schools and colleges organised in Wales?¹⁸

The main differences between the English system and that used in Wales are as follows:

Types of school

Like England, Wales has state (maintained) schools, special schools and independent schools, and there is not the same diversity of state funding mechanisms seen in England. These schools cover both primary and secondary age pupils up to 19 years old in the same way. There are no state selective schools in Wales. The schools' inspectorate is Estyn.¹⁹

National Curriculum, Key Stages and assessment

The National Curriculum in Wales was based upon the National Curriculum in England but has diverged over the years to meet the needs of learners in Wales. However, the basic principles are still relevant. The Year system is the same as in England. The National Curriculum has changes considerably in Wales since 2008.

The Programme of Study for Science lies within Knowledge and Understanding of the World (WAG 2008). There is an emphasis on giving pupils experiences that help them to increase their curiosity about the world around them and on developing key science enquiry skills. Pupils are also encouraged to begin to reflect and evaluate their own and others' work. This emphasis on skills development is reflected across all areas of learning within the Foundation Phase and is supported by the WAG document 'Skills framework for 3 to 19-year-olds in Wales' Schools are also encouraged to develop links within the different elements of Knowledge and Understanding of the World. The Programmes of Study also cover scientific knowledge and understanding known as the 'Range'. Schools are free to organise the curriculum as they wish.

Some schools teach through the medium of Welsh – in these instances Welsh replaces English as a core subject at Key Stage 1 and is taught alongside English as a core subject at Key Stages 2, 3 and 4. For schools that teach through the medium of English, the core subjects taught are the same as in England. Unlike England ICT is not statutory at KS4 in Wales.

There are around 450 - 500 Primary schools in Wales where Welsh is the language of the school and English is taught only as a Subject. You also get Welsh medium schools in most big towns in Wales.

Every school in Wales must teach Welsh as a first or a Second language it's a part of the mandatory curriculum. Welsh is treated like English, Maths and Science a core subject

¹⁸ Education in Wales - go to <http://wales.gov.uk/topics/educationandskills/?lang=en>

¹⁹ Estyn - go to <http://www.estyn.gov.uk/>

The Key Stages are the same as in England. Wales has removed SATs from its assessment methods for Key Stages 1, 2 and 3. Pupils are assessed by teachers at the end of each Key Stage to record attainment and so that performance can be centrally monitored. As a result of these changes, there are no published league tables for individual schools.

Welsh Baccalaureate Diploma

While Wales uses GCSEs in the same way that England does, at the post-16 level, Wales has introduced the Welsh Baccalaureate Diploma ('WBac'). This qualification includes other qualifications like A levels and GCSEs and is offered at 3 levels. It adds breadth and balance through a core programme of activities including key skills such as work-related education and enterprise.

Many schools follow vocational courses in order and teachers have expressed that this is the area where they feel that pupils will benefit most from Ambassador interaction.

In Wales since Sept 2010 all pupils study Essential Skills.

Essential Skills Wales (ESW) is a suite of skills currently consisting of three different skills qualifications. Qualifications are available from entry level 1 through to level 4 in:

1. Communication;
2. Application of Number and;
3. Information Communication Technology.

This new suite of skills qualifications brings together the current Key Skills of Communication, AoN and ICT, Basic Skills of Adult Literacy and Adult Numeracy, and ICT Skills for Life into a single suite of skills qualifications. ESW will be implemented in Wales from the 1st of September 2010.

In due course and following revision, the suite will also include the current Wider Key Skills of Improving Own Learning and Performance, Working with Others and Problem Solving. Essential Skills Wales are the only basic skills qualifications offered in Wales. They are available at Entry Levels 1 to 3, and at Levels 1, 2, 3 and 4. Centres can offer Essential Skills Wales as stand-alone qualifications or as a key component of other qualifications, including **BTEC Apprenticeships**²⁰ and the **Welsh Baccalaureate**²¹.

More detailed information on the BTEC course centres can be found on the EdExel Examination Board website²².

²⁰ Go to www.edexcel.com/quals/btec-apprenticeships

²¹ Go to <http://wales.gov.uk/topics/educationandskills/learners/welshbaccalaureatequalification/?lang=en>

²² Go to www.edexcel.com/Pages/Home.aspx

Section 8 - How are schools and colleges organised in Northern Ireland?

The main differences between the English system and that used in Northern Ireland are as follows:

Types of school

Like England, Northern Ireland has state schools (Controlled) Catholic schools (Maintained), Integrated schools, special schools, Voluntary schools and a few independent schools, although there is not the same diversity of state funding mechanisms seen in England. These schools cover both primary and secondary age pupils up to 19 years old in the same way. There are 69 selective Grammar schools, with pupils taking the transfer test in the last year of primary school. Another feature of Northern Ireland schooling is the division into Catholic and Protestant schools, as well as some described as 'Integrated'. Education and Library Boards carry out similar functions to English Local Authorities. Schools are inspected by the Education and Training Inspectorate.²³

National Curriculum, Key Stages and assessment²⁴

Key Stages and Years are organised as follows:

Key Stage	Year group	Ages	Assessments
Pre-school	Nursery		None
Foundation Stage	1-2	4-5	Pupil profile
KS1	3-4	6-7	Pupil profile
KS2	5-7	8-11	Pupil profile
KS3	8-10	11-14	Pupil profile
KS4	11-12	14-16	GCSEs and vocational
Post-16	13-14 (Sixth form)	16-18	AS/A2 and vocational

Primary

Northern Ireland has a National Curriculum for Primary education divided into six 'areas of learning':

1. Language and Literacy
2. Mathematics and Numeracy

²³ ETI - go to www.etini.gov.uk

²⁴ Northern Ireland curriculum – go to www.nicurriculum.org.uk
Department of Education Northern Ireland – go to www.deni.gov.uk
Council for Curriculum, Examinations and Assessment – go to www.ccea.org.uk

3. The Arts
4. The World Around Us (includes science and technology)
5. Personal Development and Mutual Understanding
6. Physical Education

There are also cross curricular skills (Communication, Using Mathematics and Using ICT) as well as Thinking Skills & Personal Capabilities.

Secondary

Rather than having detailed programmes of study, teachers at Key Stage 3 have flexibility through statements of minimum requirement. An emphasis is placed on skills development throughout all the learning areas:

1. The Arts
2. English (or Irish)
3. Environment and Society
4. Mathematics (and Numeracy)
5. Modern languages
6. Physical Education
7. Science and Technology
8. Religious Education

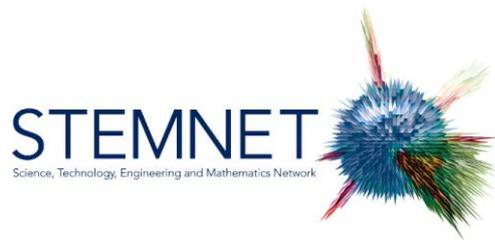
There are also cross curricular skills (Communication, Using Mathematics and Using ICT) as well as Thinking Skills & Personal Capabilities.

At Key stage 4 the statutory curriculum is minimal requiring that pupils study:-

- Communication (English or Irish in an Irish-medium school)
- Using Maths (Mathematics)
- Using ICT
- Other skills (problem solving, self-management, working with others)
- Physical Education
- Learning for Life and work
- Religious Education

In addition, schools must provide appropriate access to the subjects within each of the other Learning Areas. This minimum requirement allows schools the flexibility to develop learning programmes which meet the specific needs and aspirations of their pupils.

Learning for Life and Work is a statutory requirement for Key Stages 3 and 4. Young people need to prepare for the demands of life and work as individuals, as contributors to society and in the context of an ever-changing local and global economy. Helping them to achieve this requires an emphasis on acquiring transferable skills and capabilities to produce more effective and flexible life-long learners. Learning for Life and Work is divided into Employability, Local and Global Citizenship, Personal Development and Home Economics.



In addition, pupils must be provided with Careers Education Information Advice and Guidance throughout their post-primary education which supports personal career planning and decision making at key transition points.

Section 9 - How are schools and colleges organised in Scotland?

Education is a devolved issue where schools are fully funded by the Scottish Government and administered by the Education and Lifelong Learning Directorate.

Traditionally, the Scottish system at secondary school level has emphasized breadth across a range of subjects, while the English, Welsh and Northern Irish systems have emphasised greater depth of education over a smaller range of subjects.

Types of school

Like the rest of the UK, Scotland has state (maintained) schools, special schools and independent schools, although there is not the range of state funding mechanisms seen in England. As of June 2011 there were a total of 2153 Primary schools, 376 Secondary schools and 193 special schools. Of the total 2722 schools, 377 are state funded faith schools.

There is not a set name for secondary schools in Scotland, but whatever they are called (High Schools, Secondary Schools, Grammar Schools, Academies or Junior High Schools), with just a few specific exceptions in mainly rural or island authorities, they are all fully-comprehensive non-selective state secondary schools. There are no state selective schools in Scotland, even though some schools have 'Grammar school' in the name.

The schools' inspectorate is Her Majesty's Inspectorate of Education²⁵.

Curriculum

Children usually start school at age 5, although some are younger, and then move into secondary school at age 11 or 12. Whilst pupils can leave school when they reach 16 (i.e. in their 4th year) the majority stay on to 5th or 6th Year.

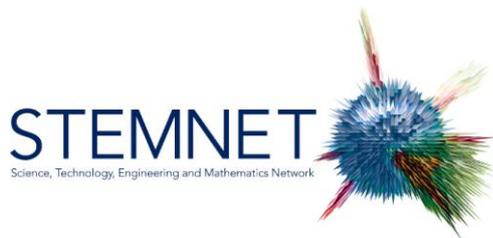
Years in school are organised as follows:

School	Year group	Age at end of year
Primary	P1 to P7	5 to 12
Secondary	S1 to S6 (or 'First' to 'Sixth' Years)	12 to 18

Often pupils start to make subject selection in S1 which may determine their choices later.

Scotland has a comprehensive education system with a flexible curriculum that is not set by law. What is taught in schools is based on the recently introduced '**Curriculum for Excellence**' (CfE) prepared by Learning and Teaching Scotland on behalf of the Scottish

²⁵ Go to www.hmie.gov.uk



Government²⁶. This provides guidance on which areas should be covered but does not dictate detailed curriculum content thus allowing teachers to use their own knowledge and experience to meet the *Experiences* and *Outcomes* for each year.

The Experiences and Outcomes²⁷ describe the expectations for learning and progression for each of the eight curriculum areas listed below:

- Expressive arts
- Health and wellbeing
- Languages
- Mathematics
- Religious and moral education
- Sciences
- Social studies
- Technologies

Whilst these eight curriculum subject areas are taught, a key feature of CfE is the interdisciplinary approach to teaching these subjects in order to reflect the real world of work.

An integral aspect of CfE is the development of the four ‘capacities’ in the young people of Scotland. These are: *successful learners, confident individuals, effective contributors and responsible citizens*.

The experiences and outcomes for each curriculum area build in the attributes and capabilities which support the development of the four capacities. This means that, taken together across curriculum areas, the experiences and outcomes contribute to the attributes and capabilities leading to the four capacities.

What are the implications for STEM Ambassadors?

STEM Ambassadors act as powerful role models for the 4 capacities.

- sessions on their careers and demonstrations of the things they do in work act as clear examples of how the above subjects interrelate in the real world of work e.g. how mathematics is an inherent aspect of most jobs.
- even with the new CfE teachers of STEM subjects at secondary level are not expected to know a lot about their the subject areas they do not teach so this is a great opportunity for STEM Ambassadors to support them.

²⁶ Go to www.ltscotland.org.uk/understandingthecurriculum/

²⁷ For more information on the Experience and Outcomes expected as part of the Curriculum for Excellence go to <http://www.ltscotland.org.uk/understandingthecurriculum/howisthecurriculumstructured/experiencesandoutcomes/index.asp>



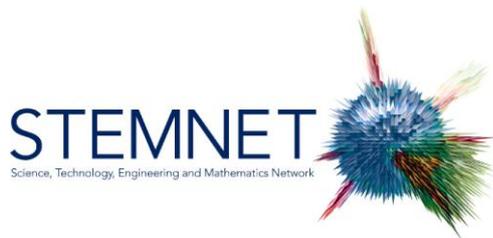
- Primary school teachers are often less confident teaching science but a session with a STEM Ambassador and their class leaves them with legacy knowledge and confidence.
- Demonstrations of the range of careers available to support pupils to select the right subject choices in S1 and S2 as well as later years.
- The science **Experiences** and **Outcomes** includes “topical science” whereby pupils are required to learn about contemporary science and scientists

Qualifications: National qualifications are organised as follows:

Level	Information
Access 1, 2 Access 3 (Standard Grade Foundation level)	For pupils who require support with their learning. Access courses are assessed by the school.
Intermediate 1 (Standard Grade General level) Intermediate 2 (Standard Grade Credit level)	For pupils who have completed Foundation level Standard Grade or other courses at Access 3. Generally taken over the third and fourth year at most secondary schools and are subject to external examination, administered through the Scottish Qualifications Authority ²⁸ . Candidates often take seven or eight subjects, including Mathematics and English. Standard Grades are being replaced by new ‘ National 4 ’ and ‘ National 5 ’ qualifications.
Higher	For pupils who have passed subjects at Standard Grade Credit Level, or Intermediate 2. Normally needed for entry to university or college to study for a degree, higher national certificate or Diploma Courses.
Advanced Higher	For pupils who have passed Highers, and are usually taken in sixth year of school or at college. Demanding qualifications that extend the skills and knowledge gained at Higher.

In addition to the above qualifications Scotland introduced a Science Baccalaureate in 2010 and a Language one prior to this. The Science Baccalaureate is based on a group of subjects at Higher and Advanced Higher level with the addition of an Interdisciplinary Project.

²⁸ Go to www.sqa.org.uk



The Scottish Qualifications Authority is the responsible body for all the above qualifications which are set out in the Scottish Credit and Qualifications Framework (SCQF)²⁹

What are the implications for STEM Ambassadors?

- the new Chemistry and Physics Highers include research projects where pupils would benefit from mentoring or guidance from STEM Ambassadors – on science content as well as the process of planning and running a research project.
- activities previously not required in Highers have been introduced and schools would benefit from equipment from outside or specialist help, e.g. PCR in Biology/neuroscience section.
- mentoring and input to the Science Baccalaureate especially the Interdisciplinary Project

²⁹ Go to www.sqa.org.uk/sqa/14329.html



Section 10 - Glossary of useful terms

The following are abbreviations and terms you may hear in your experience as a STEM Ambassador:

AEA	Advanced Extension Award
AS	Advanced Subsidiary Level, normally taken in Year 12
A2	Taken after AS to complete A level
ASE	Association for Science Education www.ase.org.uk
BSA	British Science Association www.britishecienceassociation.org
BTEC	Business and Technical Education Council
C&G	City and Guilds
CBI	Confederation of British Industry www.cbi.org.uk Lobbying organisation for British Businesses
CITB	Construction Industry Training Board
COSHH	Control of Substances Hazardous to Health (See Risk Assessment in main document)
CPD	Continuing Professional Development
CRB	Criminal Records Bureau
CREST	CREativity in Science and Technology (Series of awards for pupils given by the British Science Association)
CTC	City Technology College
DATA	The Design and Technology Association www.data.org.uk
D&T	Design and Technology
DfE	Department for Education www.dfe.gov.uk
BIS	Department for Business, Innovation and Skills www.bis.gov.uk
EBAcc or EBac	English Baccalaureate
EBP	Education Business Partnership
EC	Engineering Council
EES	Engineering Education Scheme
Engineering UK	Engineering UK www.engineeringuk.com
FE	Further Education
GCE	General Certificate of Education (usually in reference to A level)
GCSE	General Certificate of Secondary Education
GetSET	Girls Entering Tomorrow's Science, Engineering and Technology www.theukrc.org/women/getset-women
HE	Higher Education
H&S	Health and Safety
H&SE	Health and Safety Executive www.hse.gov.uk
HNC	Higher National Certificate



HND	Higher National Diploma
INSET	In-Service Education and Training (Teacher training)
IS	Industrial Society
ICT	Information and Communication Technology
ITT or ITE	Initial Teacher Training (or Education)
JEB	Junior Engineers for Britain (Competition)
KS1,2,3,4	Key Stage 1, 2, 3, 4 (pupils aged 5-7, 7-11, 11-14, 14-16)
LA	Local Authority
MTA	Manufacturing Technologies Association www.mta.org.uk
NCVQ	National Council for Vocational Qualifications
NVQ	National Vocational Qualification
OFSTED or Ofsted	Office for Standards in Education, Children's Services and Skills
PGCE	Postgraduate Certificate of Education
QCA or QCDA	Qualifications and Curriculum Authority (no longer exists but still referred to) – replaced by QCDA (Qualifications and Curriculum Development Agency)
RAE or RAEng	Royal Academy of Engineering www.raeng.org.uk
SATs	Standard Assessment Tasks
Scheme of Work/Learning	Medium term curriculum plans covering more than one lesson, or a whole unit of work
SEN	Special Education Needs
SENCO	Special Education Needs Co-ordinator
SET	Science, Engineering and Technology
STEM	Science, Technology, Engineering and Mathematics
STEMNET	Science, Technology, Engineering and Mathematics Network
SEP	Science Enhancement Programme
TEP	Technology Enhancement Programme
Ufi	University for Industry
UI	Understanding Industry
WISE	Women Into Science and Engineering
WRL	Work-related Learning
YE	Young Engineers
YE	Young Enterprise
YEB	Young Engineers for Britain