

Curriculum Mapping Document

The BT Young Scientist and Technology Exhibition

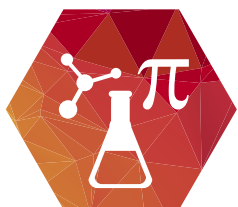
In its 52nd year the BT Young Scientist & Technology Exhibition is much more than a competition; it is an unforgettable experience of a lifetime for the students who take part. The exhibition itself is the final stage in the competition which is open to all second level students from Ireland, both North and South. Students enter a project within one of four categories (as detailed below), for the chance to be part of the final exhibition in Dublin. Our Entry Details booklet enclosed provides a full overview of the BT Young Scientist & Technology Exhibition and you can find any further information you may need on our website www.btyoungscientist.com

The 4 Category Choices:



Biological and Ecological Sciences

For a project to be accepted into this category it must have a biological and/or ecological focus and investigate aspects of animal, human, microbial or plant biology. Typically, projects deal with the following areas of study: agriculture, anatomy, animal science, biochemistry, biotechnology, disease, ecology, environmental science, enzymology, forestry, food science, genetics, horticulture, medical science, metabolism, microbiology, molecular biology, physiology, physiotherapy, plant science or veterinary science.



Chemical, Physical and Mathematical Sciences

For a project to be accepted into this category it must be based on chemistry, physics, mathematics, applied mathematics, engineering, computer programming and language or electronics. Also eligible are projects based on earth and space sciences such as meteorology, geophysics, geology and astronomy.



Social and Behavioural Sciences

For a project to be accepted into this category it must cover social and behavioural sciences, economic, geographical, psychological or sociological studies of human behaviour, attitudes and experience, social analysis of environmental factors, demography, learning and perception as well as the study of attitudes and behaviour in relation to health, nutrition, work, leisure and living habits are all included here. Also eligible are projects on consumer affairs, effects on society, social anthropology and political science provided they involve the use of scientific methods.



Technology

For a project to be accepted into the technology category the core of the project must be the use of technology in new or improved applications, enhanced efficiencies, new innovations or better ways to do things. The category could include things related to the Internet, communications, electronic systems, robotics, control technology, applications of technology, biotechnology innovative developments to existing problems, computing and automation. Students are also expected to understand the basic science behind the technology so that they can get the most from the project.



Examples of projects

Project title	Category	Group / Individual	Age Group
Sonic Pathways	Technology	Group	Senior
The development of a non-invasive, cuff-less Blood Pressure Monitor and the study of people's awareness of Blood Pressure	Technology	Group	Intermediate
Blind sensor aid	Technology	Individual	Junior
An Investigation into the Effectiveness of Sunscreens	Chemical, Physical & Mathematical Sciences	Group	Intermediate
Can changing the albedo of urban surfaces (roofs and pavements) reduce global warming and thus lower CO2 emissions?	Chemical, Physical & Mathematical Sciences	Group	Senior
Under the Influence: Drink or Diet	Chemical, Physical & Mathematical Sciences	Individual	Junior
The viability and sustainability of marine ecosystems under common manmade conditions	Biological and Ecological	Group	Intermediate
To Investigate the Different Species of Micro- Organisms and their Ability to Survive Depending on the Concentration of Chlorine Found in Various Treated Water Samples	Biological and Ecological	Group	Senior
Enabling Diabetics to Participate in Sport Better	Biological and Ecological	Individual	Junior
To investigate music's effect on the performance of athletes	Social and Behavioural Sciences	Group	Intermediate
The Stages of Change of smokers in relation to their smoking habits	Social and Behavioural Sciences	Group	Senior
Do boys or girls of different ages have better visual memory?	Social and Behavioural Sciences	Group	Junior

Relevance to the Northern Ireland Curriculum Key Stages 3 & 4 and post 16

All topics chosen for the competition must be able to be scientifically proven or disproved by research methods available to second level students i.e. the project must involve the use of scientific methods.

Specific curriculum links to Whole Curriculum Skills and Capabilities at Key Stage 3

Key Stage 3

The BT Young Scientist and Technology Exhibition meets some of the statutory requirements relating to Cross-Curricular Skills:

Skills	Opportunities for Skills development
Developing Communication Skills across the curriculum	Pupils should be given opportunities to engage with and demonstrate the skill of communication and to transfer their knowledge about communication concepts and skills to real-life meaningful contexts across the curriculum.
Using Mathematics across the curriculum	Pupils should be given opportunities to transfer their understanding, as appropriate, to other contexts across the curriculum. Pupils can demonstrate their mathematical knowledge, understanding and skills in a variety of ways to communicate, manage information, think critically, solve problems and make decisions.
Using Information and Communications Technology across the curriculum	Pupils should have opportunities, using ICT, to engage in genuine research and purposeful tasks set in meaningful contexts. They should be encouraged to re-work information, present and exchange their ideas and translate their thinking into creative products and productions which show an awareness of audience and purpose.

Key Stage 3

The BT Young Scientist and Technology Exhibition meets some of the statutory requirements relating to: Thinking Skills and Personal Capabilities

Area	Involves
Managing Information	Asking, Accessing, Selecting, Recording, Integrating, Communicating
Working with Others involves:	Being Collaborative, Being Sensitive To Others' Feelings, Being Fair and Responsible
Thinking, Problem-Solving and Decision-Making	Searching for Meaning, Deepening Understanding, Coping with Challenges
Being Creative	Imagining, Generating, Inventing, Taking Risks for Learning
Self-Management	Evaluating Strengths and Weaknesses, Setting Goals and Targets, Managing and Regulating Self

Specific curriculum links to Areas of Learning and Subject Strands at Key Stage 3

Junior Age Group Category	Key Stage 3 area of learning	Subject Strands	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences	Mathematics and Numeracy	Mathematics Financial Capability	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to Mathematics and Financial Capability:</p> <ul style="list-style-type: none"> • Knowledge of number; algebra; shape, space and measures; and handling data • Knowledge and understanding of personal finance issues • The application of mathematical skills to real life and work situations • The creative use of technology to enhance mathematical understanding and give opportunities to demonstrate skills and application of knowledge and understanding of Mathematics (Learning Outcomes)
Biological and Ecological Sciences Social and Behavioural Sciences Chemical, Physical and Mathematical Sciences	Environment and Society	Geography	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to Geography:</p> <ul style="list-style-type: none"> • develop geographical skills to interpret spatial patterns including atlas and map-work skills • develop enquiry and fieldwork skills: questioning, planning, collecting, recording, presenting, analysing, interpreting information and drawing conclusions relating to a range of primary and secondary sources • develop critical and creative thinking skills to solve geographical problems and make informed decisions • develop an understanding of: <ul style="list-style-type: none"> – physical processes of landscape development – the interrelationships between physical and human environments – the dynamic nature of physical and human environments – the ways in which places are interdependent – the need for social, economic and environmental change to be sustainable and give opportunities to demonstrate skills and application of knowledge and understanding of Geography (Learning Outcomes)

Junior Age Group Category	Key Stage 3 area of learning	Subject Strands	Contribution of the BT Young Scientist & Technology Exhibition
Biological and Ecological Sciences Chemical, Physical and Mathematical Sciences Technology	Science and Technology	Science Technology and Design	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to Science:</p> <ul style="list-style-type: none"> • Develop skills in scientific methods of enquiry to further scientific knowledge and understanding: <ul style="list-style-type: none"> – develop creative and critical thinking; – research scientific information from a range of sources and develop a range of practical skills. • Learn about: <ul style="list-style-type: none"> – Organisms and Health – Chemical and material behaviour – Forces and energy – Earth and Universe <p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to Technology and Design:</p> <ul style="list-style-type: none"> • Develop creative and creative thinking and problem solving skills through: <ul style="list-style-type: none"> – Design – Communication – Manufacturing – Control <p>and give opportunities to demonstrate skills and application of knowledge and understanding of Science, Technology and Design (Learning Outcomes)</p>
Social and Behavioural Sciences	Learning for Life and Work	Personal Development Home Economics	<p>Participating in the BT Young Scientist & Technology Exhibition could meet some of the statutory requirements relating to the Key Concepts of Personal Development:</p> <ul style="list-style-type: none"> • Self Awareness • Personal Health • Relationships <p>Home Economics:</p> <ul style="list-style-type: none"> • Healthy Eating • Home and Family Life • Independent Living <p>and give opportunities to demonstrate skills and application of knowledge and understanding of Personal Development and Home Economics (Learning Outcomes)</p>

Key Stage 4

The BT Young Scientist and Technology Exhibition meets some of the statutory requirements relating to Skills:

Skills	Opportunities for Skills development
Communication	<p>Teachers should enable pupils to develop skills in:</p> <ul style="list-style-type: none"> • communicating meaning, feelings and viewpoints in a logical and coherent manner • making oral and written summaries, reports and presentations, which take account of audience and purpose • participating in discussions, debates and interviews • interpreting, analysing and presenting information in oral, written and ICT formats • exploring and responding, both imaginatively and critically, to a variety of texts
Using Mathematics	<p>Teachers should enable pupils to develop skills in:</p> <ul style="list-style-type: none"> • using mathematical language and notation with confidence • using mental computation to calculate, estimate and make predictions in a range of simulated and real life contexts • selecting and applying mathematical concepts and problem-solving strategies in a range of simulated and real-life contexts • interpreting and analysing a wide range of mathematical data • assessing probability and risk in a range of simulated and real life contexts • presenting mathematical data in a variety of formats which take account of audience and purpose
Using Information and Communications Technology	<p>Teachers should enable pupils to develop skills in:</p> <ul style="list-style-type: none"> • making effective use of information and communications technology in a wide range of contexts to access, manage, select and present information, including mathematical information.
Problem solving (including thinking, decision making and being creative).	
Working with Others	
Self Management	

Specific curriculum links to Areas of Learning at Key Stage 4

CCEA Qualifications

Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences	Mathematics and Numeracy	Mathematics	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the four areas of study in Mathematics listed below:</p> <ul style="list-style-type: none"> • Using and Applying Mathematics • Number and Algebra • Shape, Space and Measures • Handling Data <p>and give opportunities to:</p> <ul style="list-style-type: none"> • develop their mathematical knowledge and oral, written and practical skills in a manner which encourages confidence • read mathematics, and write and talk about the subject in a variety of ways • develop a feel for number, carry out calculations and understand the significance of the results obtained • apply mathematics in everyday situations and develop an understanding of the part which mathematics plays in the world around them • solve problems, present the solutions clearly, check and interpret the results • develop an understanding of mathematical principles • recognise when and how a situation may be represented mathematically, identify and interpret relevant factors and, where necessary, select an appropriate mathematical method to solve problems • use mathematics as a means of communication with emphasis on the use of clear expression • develop the abilities to reason logically, to classify, to generalise and to prove • appreciate patterns and relationships in mathematics • produce and appreciate imaginative and creative work arising from mathematical ideas • develop their mathematical abilities by considering problems and conducting individual and co-operative enquiry and experiment, including pieces of work of a practical and investigative kind • appreciate the interdependence of different branches of mathematics



Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
<p>Biological and Ecological Sciences</p> <p>Social and Behavioural Sciences</p> <p>Chemical, Physical and Mathematical Sciences</p>	<p>Environment and Society</p>	<p>Geography</p>	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units of study in Geography:</p> <ul style="list-style-type: none"> • Understanding Our Natural World • Living in Our World <p>and give opportunities to:</p> <ul style="list-style-type: none"> • actively engage in the process of geography to develop as effective and independent learners and as critical thinkers with enquiring minds • develop their knowledge and understanding of geographical concepts and • appreciate how these concepts affect our changing world • develop and apply their learning to the real world through fieldwork and other • learning outside the classroom • use geographical skills, appropriate technologies, and enquiry and analysis skills
<p>Biological and Ecological Sciences</p> <p>Chemical, Physical and Mathematical Sciences</p> <p>Technology</p>	<p>Science and Technology</p>	<p>Science</p>	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units of study in Double Award Science:</p> <ul style="list-style-type: none"> • Living Processes and Biodiversity • Body Systems, Genetics, Microorganisms and Health • Structures, Trends and Chemicals Reactions • Further Chemical Reactions and Organic Chemistry • Force and Motion, Energy, Moments, and Radioactivity • Waves, Sound and Light, Electricity and the Earth and Universe <p>and give opportunities to:</p> <ul style="list-style-type: none"> • acquire a systematic body of scientific knowledge, and the skills needed to apply this in new and changing situations in a range of domestic, industrial and environmental contexts • acquire an understanding of scientific ideas, how they develop, the factors which may affect their development and their power and limitations • evaluate (in terms of their scientific knowledge and understanding) the benefits and drawbacks of scientific and technological developments (including those related to the environment, personal health and quality of life) and consider ethical issues, where appropriate • select, organise and present information clearly and logically, using appropriate scientific terms and conventions, and using ICT where appropriate • develop an awareness of the role of science in society, its potential and limitations, and develop STEM-related skills



Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Biological and Ecological Sciences Chemical, Physical and Mathematical Sciences Technology (continued)	Science and Technology	Technology and Design	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units of study in Technology and Design:</p> <ul style="list-style-type: none"> • Technology and Design Core • Systems and Control • Product Design <p>projects could be related to the Unit 5: Design Project and give opportunities to:</p> <ul style="list-style-type: none"> • Undertake designing and manufacturing, leading to the production of purposeful outcomes • Gain an appreciation of the contribution of technology to economic and social development and of the positive and negative effects of technology activities on the environment • Understand the importance of quality in all aspects of their work
Social and Behavioural Sciences	Learning for Life and Work	Personal Development	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to Personal Development.</p> <p>The BT Young Scientist & Technology Exhibition could provide opportunities to:</p> <ul style="list-style-type: none"> • develop an understanding of how to maximise and sustain their own health and well-being • reflect on, and respond to, their developing concept of self, including managing emotions and reactions to on-going life experiences • recognise, assess and manage risk in a range of real-life contexts • develop their understanding of relationships and sexuality and the responsibilities of healthy relationships • develop an understanding of the roles and responsibilities of parenting • develop further their competence as discerning consumers in preparation for independent living

Intermediate Age Group Category	Other non-statutory subjects at Key Stage 4 (CEA qualifications)	Contribution of the BT Young Scientist & Technology Exhibition
Biological and Ecological Sciences Social and Behavioural Sciences	Home Economics	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units of study in Home Economics:</p> <p>Unit 1: Diet and Health, and Consumer Awareness Unit 2: Diet and Health Unit 3: Consumer Awareness</p> <p>and give opportunities to:</p> <ul style="list-style-type: none"> • increase their knowledge and understanding of relevant technological and scientific developments • develop a critical and analytical approach to decision-making and problem-solving in relation to the specified content • examine issues that affect the quality of human life, including an appreciation of diversity • evaluate choices and decisions to develop as informed and discerning consumers • actively engage in the processes of home economics to develop as effective and independent learners

Specific curriculum links to Areas of Learning at Key Stage 4

AQA Qualifications

Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject AQA Qualification	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences	Mathematics and Numeracy	Mathematics (teaching from 2015)	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the six areas of study in Mathematics:</p> <ul style="list-style-type: none"> • Number • Algebra • Ratio • Geometry • Probability and statistics <p>and give opportunities to:</p> <ul style="list-style-type: none"> • develop fluent knowledge, skills and understanding of mathematical methods and concepts • acquire, select and apply mathematical techniques to solve problems • reason mathematically, make deductions and inferences and draw conclusions • comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context • develop confidence in, and a positive attitude towards, mathematics and to recognise the importance of mathematics in their own lives and to society



Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject AQA Qualification	Contribution of the BT Young Scientist & Technology Exhibition
<p>Biological and Ecological Sciences</p> <p>Social and Behavioural Sciences</p> <p>Chemical, Physical and Mathematical Sciences</p>	<p>Environment and Society</p>	<p>Geography A</p>	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units of Study in Geography A:</p> <p>Unit 1 – Physical Geography</p> <p>Unit 2 – Human Geography</p> <p>Unit 3 – Local Fieldwork Investigation</p> <p>and give opportunities to:</p> <ul style="list-style-type: none"> • Actively engage in the process of geography to develop as effective and independent learners and as critical and reflective thinkers with enquiring minds • Develop their knowledge and understanding of geographical concepts and appreciate the relevance of these concepts to our changing world • Develop a framework of spatial awareness in which to appreciate the importance of the location of places and environments from local to global • Understand the significance of values and attitudes to the development and resolution of issues • Develop their responsibility as global citizens and recognise how they can contribute to a future that is sustainable and inclusive • Develop and apply their learning to the real world through fieldwork and other out of classroom learning • Use of geographical skills, appropriate technologies, enquiry and analysis
		<p>Geography B</p>	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units of study in Geography B:</p> <p>Unit 1: Managing places in the 21st century</p> <p>Unit 2: Hostile world and Investigating the shrinking world</p> <p>Unit 3: Local investigation including fieldwork and geographical issue investigation</p> <p>and give opportunities to:</p> <ul style="list-style-type: none"> • Actively engage in the process of geography to develop as effective and independent learners and as critical and reflective thinkers with enquiring minds • Develop their knowledge and understanding of geographical concepts and appreciate the relevance of these concepts to our changing world • Develop a framework of spatial awareness in which to appreciate the importance of the location of places and environments from local to global • Understand the significance of values and attitudes to the development and resolution of issues



Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject AQA Qualification	Contribution of the BT Young Scientist & Technology Exhibition
		Geography B (continued)	<ul style="list-style-type: none"> • Develop their responsibility as global citizens and recognise how they can contribute to a future that is sustainable and inclusive • Develop and apply their learning to the real world through fieldwork and other out of classroom learning • Use of geographical skills, appropriate technologies, enquiry and analysis
<p>Biological and Ecological Sciences</p> <p>Chemical, Physical and Mathematical Sciences</p> <p>Technology</p>	<p>Science and Technology</p>	<p>Physics</p>	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's skills, knowledge and understanding of the Units of study in Physics:</p> <ul style="list-style-type: none"> • How Science Works (integrated and delivered in the context of the content in Physics 1, Physics 2 and Physics 3) • Unit Physics 1 • Unit Physics 2 • Unit Physics 3 <p>and give opportunities for pupils to:</p> <ul style="list-style-type: none"> • develop their knowledge and understanding of physics • develop their understanding of the effects of physics and its applications on society • develop an understanding of the importance of scale in physics • develop and apply their knowledge and understanding of the nature of science and of the scientific process • develop their understanding of the relationships between hypotheses, evidence, theories and explanations • develop their awareness of risk and the ability to assess potential risk in the context of potential benefits • develop and apply their observational, practical, modelling, enquiry and problem-solving skills and understanding in the laboratory and other learning environments • develop their ability to evaluate claims based on science through critical analysis of the methodology, evidence and conclusions both qualitatively and quantitatively • develop their skills in communication, mathematics and the use of technology in scientific contexts.



Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject AQA Qualification	Contribution of the BT Young Scientist & Technology Exhibition
Biological and Ecological Sciences Chemical, Physical and Mathematical Sciences Technology	Science and Technology	Chemistry	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's skills, knowledge and understanding of the Units of study in Chemistry:</p> <ul style="list-style-type: none">• How Science Works. (integrated and delivered in the context of the content in Chemistry 1, Chemistry 2 and Chemistry)• Unit Chemistry 1• Unit Chemistry 2• Unit Chemistry 3 <p>and give opportunities for pupils to:</p> <ul style="list-style-type: none">• develop their knowledge and understanding of chemistry• develop their understanding of the effects of chemistry on society• develop an understanding of the importance of scale in chemistry• develop and apply their knowledge and understanding of the nature of science and of the scientific process• develop their understanding of the relationships between hypotheses, evidence, theories and explanations• develop their awareness of risk and the ability to assess potential risk in the context of potential benefits• develop and apply their observational, practical, modelling, enquiry and problem-solving skills and understanding in the laboratory and other learning environments• develop their ability to evaluate claims based on science through critical analysis of the methodology, evidence and conclusions both qualitatively and quantitatively• develop their skills in communication, mathematics and the use of technology in scientific contexts.



Intermediate Age Group Category	Key Stage 4 statutory areas of learning	Subject AQA Qualification	Contribution of the BT Young Scientist & Technology Exhibition
<p>Biological and Ecological Sciences</p> <p>Chemical, Physical and Mathematical Sciences</p> <p>Technology</p>	<p>Science and Technology</p>	<p>Biology</p>	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's skills, knowledge and understanding of the Units of study in Biology:</p> <ul style="list-style-type: none"> • How Science Works. (integrated and delivered in the context of the content in Biology 1, Biology 2 and Biology 3) • Unit Biology 1 • Unit Biology 2 • Unit Biology 3 <p>and give opportunities for pupils to:</p> <ul style="list-style-type: none"> • develop their knowledge and understanding of biology • develop their understanding of the effects of biology on society • develop an understanding of the importance of scale in biology • develop and apply their knowledge and understanding of the nature of science and of the scientific process • develop their understanding of the relationships between hypotheses, evidence, theories and explanations • develop their awareness of risk and the ability to assess potential risk in the context of potential benefits • develop and apply their observational, practical, modelling, enquiry and problem-solving skills and understanding in laboratory, field and other learning environments • develop their ability to evaluate claims based on science through critical analysis of the methodology, evidence and conclusions both qualitatively and quantitatively • develop their skills in communication, mathematics and the use of technology in scientific contexts.

AQA offer a wide range of subjects at GCSE including those listed below. Teachers of these subjects could consider entering projects to the BT YOUNG SCIENTIST & TECHNOLOGY EXHIBITION

Intermediate Age Group Category	Other non-statutory subjects at Key Stage 4 (AQA Qualifications)	Contribution of the BT Young Scientist & Technology Exhibition
Social and Behavioural Sciences	Sociology Health and Social Care	
Biological and Ecological Sciences Social and Behavioural Sciences	Home Economics	
Biological and Ecological Sciences Social and Behavioural Sciences	Psychology	Participating in the BT Young Scientist & Technology Exhibition could develop pupil's skills, knowledge and understanding of the subject content and provide opportunities to achieve the aims and learning outcomes of the course
Chemical, Physical and Mathematical Sciences Technology	Electronics	

Specific curriculum links to GCE qualifications

CCEA Qualifications

Senior Age Group Category	Subject at GCE (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences Technology	ICT	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in ICT:</p> <p>Unit AS 1: Components of ICT Unit AS 2: Developing ICT Solutions Unit A2 1: Information Systems Unit A2 2: Approaches to Systems Development</p> <p>and give opportunities for pupils to:</p> <ul style="list-style-type: none"> develop the capacity for thinking creatively, innovatively, analytically, logically and critically; develop the skills to work collaboratively develop the ability to apply skills, knowledge and understanding of ICT in a range of contexts to solve problems develop an understanding of the consequences of using ICT on individuals, organisations and society and of social, legal, ethical and other considerations on the use of ICT develop an awareness of emerging technologies and an appreciation of the potential impact these may have on individuals, organisations and society. <p>A project for the BT Young Scientist & Technology Exhibition could be used for A22. The project will require candidates to identify and research a realistic problem for which there must be a real end user and to provide a detailed solution which should incorporate the use of a range of advanced software features and functionalities.</p>
Biological and Ecological Sciences	Biology	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in Biology:</p> <p>Unit AS 1: Molecules and Cells Unit AS 2: Organisms and Biodiversity Unit A2 1: Physiology and Ecosystems Unit A2 2: Biochemistry, Genetics and Evolutionary trends Unit AS 3 and A23: Practical techniques</p> <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> recognise, recall and show understanding of biology knowledge select, organise and communicate relevant information in a variety of forms analyse and evaluate biology knowledge and processes apply biology knowledge and processes to unfamiliar situations, including those related to issues; and assess the validity, reliability and credibility of biology information demonstrate and describe safe and skilful practical techniques and processes, selecting appropriate qualitative and quantitative methods



Senior Age Group Category	Subject at GCE (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Biological and Ecological Sciences (continued)	Biology	<ul style="list-style-type: none"> • make, record and communicate reliable and valid observations and measurements with appropriate precision and accuracy • analyse, interpret, explain and evaluate the methodology, results and the impact of their own and others' experimental and investigative activities in a variety of ways
Chemical, Physical and Mathematical Sciences Technology	Physics	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in Physics:</p> <p>Unit AS 1: Forces, Energy and Electricity Unit AS 2: Waves, Photons and Medical Physics Unit A2 1: Momentum, Thermal Physics, Circular Motion, Oscillations and Atomic and Nuclear Physics Unit A2 2: Fields and their applications Unit AS 3: and Unit A2 3: Practical Techniques</p> <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> • Use theories, models and ideas to develop and modify physical explanations • Use knowledge and understanding to pose physical questions, define physical problems, present physical arguments and physical ideas • Use appropriate methodology, including ICT, to answer physical questions and solve physical problems • Carry out experimental and investigative activities, including appropriate risk management, in a range of contexts • Analyse and interpret data to provide evidence, recognising correlations and causal relationships • Evaluate methodology, evidence and data, and resolve conflicting evidence • Appreciate the tentative nature of physical knowledge • Communicate information and ideas in appropriate ways using appropriate terminology • Consider applications and implications of physics and appreciate their associated benefits and risks



Senior Age Group Category	Subject at GCE (CEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences	Chemistry	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in Chemistry:</p> <p>Unit AS 1: Basic Concepts in Physical and Inorganic Chemistry</p> <p>Unit AS 2: Further Physical and Inorganic Chemistry and Introduction to Organic Chemistry</p> <p>Unit A2 1: Periodic Trends and Further Organic, Physical and Inorganic Chemistry</p> <p>Unit A2 2: Analytical, Transition Metals, Electrochemistry and Further Organic Chemistry and give pupils the opportunity to:</p> <ul style="list-style-type: none">• recognise, recall and show understanding of scientific knowledge• select, organise and communicate relevant information in a variety of forms• analyse and evaluate scientific knowledge and processes• apply scientific knowledge and processes to unfamiliar situations including those related to issues• assess the validity, reliability and credibility of scientific information• demonstrate and describe ethical, safe and skilful practical techniques and processes, selecting appropriate qualitative and quantitative methods• make, record and communicate reliable and valid observations and measurements with appropriate precision and accuracy• analyse, interpret, explain and evaluate the methodology, results and impact of their own and others' experimental and investigative activities in various ways
Chemical, Physical and Mathematical Sciences	Mathematics	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in Mathematics:</p> <ul style="list-style-type: none">• Core Mathematics• Further Pure Mathematics• Mechanics• Statistics <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none">• develop their understanding of mathematics and mathematical processes in a way that promotes confidence and fosters enjoyment• develop abilities to reason logically and recognise incorrect reasoning, to generalise and to construct mathematical proofs• extend their range of mathematical skills and techniques and use them in more difficult, unstructured problems• develop an understanding of coherence and progression in mathematics and of how different areas of mathematics can be connected• recognise how a situation may be represented mathematically and understand the relationship between 'real world' problems and standard and other mathematical models and how these can be refined and improved• use mathematics as an effective means of communication• read and comprehend mathematical arguments and articles concerning



Senior Age Group Category	Subject at GCE (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences (continued)	Mathematics	applications of mathematics <ul style="list-style-type: none"> acquire the skills needed to use technology such as calculators and computers effectively, recognize when such use may be inappropriate and be aware of limitations develop an awareness of the relevance of mathematics to other fields of study, to the world of work and to society in general take increasing responsibility for their own learning and the evaluation of their own mathematical development
Biological and Ecological Sciences Social and Behavioural Sciences Chemical, Physical and Mathematical Sciences	Geography	Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in Geography : AS 1: Physical Geography (including Fieldwork skills) AS 2: Human Geography (including skills and techniques) A2 1: Human Interactions and Global Issues A2 2: Physical Geography and Decision-Making and give pupils the opportunity to: <ul style="list-style-type: none"> develop and apply their understanding of geographical concepts and processes to understand and interpret our changing world develop their awareness of the complexity of interactions within and between societies, economies, cultures and environments at scales from local to global develop as global citizens who recognise the challenges of sustainability and the implications for their own and others' lives improve as critical and reflective learners aware of the importance of attitudes and values, including their own become adept in the use and application of skills and new technologies through their geographical studies both in and outside the classroom Through participating in the BT Young Scientist & Technology Exhibition students could become conversant with the following skills and techniques: <ul style="list-style-type: none"> Data collection Data processing Methods of statistical analysis

Senior Age Group Category	Subject at GCE (CCEA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Technology	Technology and Design	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Modules in Technology and Design:</p> <p>Unit AS 1: Product Design and Systems and Control or Product Design Unit AS 2: Coursework: Product Development Unit A2 1: Systems and Control or Product Design Unit A2 2: Coursework: Product-System, Design and Manufacture</p> <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> • make use of tacit knowledge and reflective practices in order to work with tasks that are challenging and often require definition • develop and sustain their creativity and innovative practice • recognise and overcome challenges and constraints when working towards the production of high- quality products • develop a critical understanding of the influences of the processes and products of design and technological activities from a contemporary and historical perspective • draw on a range of skills and knowledge from other subject areas • draw on and apply knowledge; understanding and skills of production processes to a range of design and technological activities <p>A project for the BT Young Scientist & Technology Exhibition could be particularly useful for Units AS 2 and A2 2</p>

Specific curriculum links to GCE qualifications

AQA Qualifications

Senior Age Group Category	Subject at GCE (AQA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences Technology	ICT	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units in ICT:</p> <p>Unit 1: Practical Problem Solving in the Digital World Unit 2: Living in the Digital World Unit 3: The Use of ICT in the Digital World Unit 4: Coursework: Practical Issues Involved in the Use of ICT in the Digital World</p> <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> investigate and analyse problems and produce a specification design effective solutions select and use appropriate application software test and implement an effective ICT-related system document specifications and solutions evaluate solutions and their own performance <p>A project for the BT Young Scientist & Technology Exhibition could be used for Unit 4: which requires pupils to complete a substantial project involving the production of an ICT-related system over an extended period of time.</p>
Biological and Ecological Sciences Social and Behavioural Sciences	Psychology (from Sep 2015)	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units in Psychology where the emphasis is on applying knowledge and understanding rather than just acquiring knowledge, thereby developing pupils' transferable skills of analysis, evaluation and critical thinking.</p> <ul style="list-style-type: none"> Introductory topics in psychology Psychology in context Issues and options in psychology <p>and give opportunities for pupils to:</p> <ul style="list-style-type: none"> develop essential knowledge and understanding of different areas of the subject and how they relate to each other develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods develop competence and confidence in a variety of practical, mathematical and problem-solving skills develop their interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society.

Senior Age Group Category	Subject at GCE (AQA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Social and Behavioural Sciences	Sociology (from Sep 2015)	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units in Sociology:</p> <ul style="list-style-type: none"> • Education; Methods in Context; Research Methods • Culture and Identity; Families and Households; Health; Work, Poverty and Welfare • Education with Theory and Methods; Crime and Deviance with Theory and Methods • Topics in Sociology <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> • acquire knowledge and a critical understanding of contemporary social processes and social changes • appreciate the significance of theoretical and conceptual issues in sociological debate • understand and evaluate sociological methodology and a range of research methods through active involvement in the research process • develop skills that enable individuals to focus on their personal identity, roles and responsibilities within society • develop a lifelong interest in social issues.
Chemical, Physical and Mathematical Sciences	Mathematics	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the AS and A2 Modules in Mathematics:</p> <ul style="list-style-type: none"> • Pure Core Modules • Further Pure Modules • Statistics • Mechanics • Decision <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> • develop their understanding of mathematics and mathematical processes in a way that promotes confidence and fosters enjoyment • develop abilities to reason logically and to recognise incorrect reasoning, to generalise and to construct mathematical proofs • extend their range of mathematical skills and techniques and use them in more difficult unstructured problems • develop an understanding of coherence and progression in mathematics and of how different areas of mathematics can be connected • recognise how a situation may be represented mathematically and understand the relationship between 'real world' problems and standard and other mathematical models and how these can be refined and improved • use mathematics as an effective means of communication • read and comprehend mathematical arguments and articles concerning applications of mathematics

Senior Age Group Category	Subject at GCE (AQA Qualification)	Contribution of the BT Young Scientist & Technology Exhibition
Chemical, Physical and Mathematical Sciences (continued)	Mathematics	<ul style="list-style-type: none"> acquire the skills needed to use technology such as calculators and computers effectively, to recognise when such use may be inappropriate and to be aware of limitations develop an awareness of the relevance of mathematics to other fields of study, to the world of work and to society in general take increasing responsibility for their own learning and the evaluation of their own mathematical development
Biological and Ecological Sciences Social and Behavioural Sciences Chemical, Physical and Mathematical Sciences	Geography	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to Units 1-4 in Geography:</p> <p>Unit 1 - Physical and Human Geography Unit 2 - Geographical Skills Unit 3 - Contemporary Geographical Issues Unit 4A - Geography Fieldwork Investigation</p> <p>and give pupils the opportunity to:</p> <ul style="list-style-type: none"> develop and apply their understanding of geographical concepts and processes to understand and interpret our changing world develop their awareness of the complexity of interactions within and between societies, economies, cultures and environments at scales from local to global develop as global citizens who recognise the challenges of sustainability and the implications for their own and others' lives improve as critical and reflective learners aware of the importance of attitudes and values, including their own become adept in the use and application of skills and new technologies through their geographical studies both in and outside the classroom be inspired by the world around them, and gain enjoyment and satisfaction from their geographical studies and understand their relevance.
Technology	Design and Technology: Food Technology Design and Technology: Product Design (3-D Design) Design and Technology: Product Design (Textiles) Design and Technology: Systems and Control Technology	<p>Participating in the BT Young Scientist & Technology Exhibition could develop pupil's Knowledge, Understanding and Skills relating to the Units in:</p> <p>Design and Technology: Food Technology Design and Technology: Product Design (3-D Design) Design and Technology: Product Design (Textiles) Design and Technology: Systems and Control Technology</p> <p>and provide opportunities to achieve the aims and learning outcomes of these courses.</p>