BT YOUNG SCIENTIST & TECHNOLOGY Exhibition

2021

VIRTUAL EXHIBITION

FACTFILE

#BTYSTE

#BeyondLimits

Check out some of our videos on the links below

BTYSTE 2020 highlights

https://www.youtube.com/embed/wq5tUlfeozg

BTYSTE - What is it?

http://www.youtube.com/embed/tF4O3KKHb88

Why you should enter

https://www.youtube.com/embed/bHPsEHgk9_E

We have additional videos on our website **http://btyoungscientist.com/video-archive** and on our YouTube channel **https://www.youtube.com/user/BTYoungScientists**

Our website is your number one resource for everything you need to know about the BT Young Scientist & Technology Exhibition.

You can enter online, check out the latest news stories and access our social media channels through our website. Teachers and parents also have their own dedicated section on the site filled with useful resources.

So check it out at **www.btyoungscientist.com**

Get the app

Get all the latest information about the exhibition, events and updates direct to your mobile, absolutely free!

Features include Interactive Exhibition Map, Getting Here, Search Student Projects, Schedule of Events, Social Network, Awards, History, Past Winners, Photo Gallery and more...

Download on the App Store

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#BTYSTE #BeyondLimits

Will you be part of it?

#BeyondLimits

This FactFile has been specifically prepared to help you and will prove invaluable as you prepare your project for the BT Young Scientist & Technology Exhibition. Of course, if you have any further queries, do not hesitate to contact us at:

BT Young Scientist & Technology Exhibition,
BT, Grand Canal Plaza,
Upper Grand Canal Street, Dublin 4
Freephone: **1800 924 362**

or

BT Young Scientist & Technology Exhibition Office,
BT, Riverside Tower, 5 Lanyon Place,
Belfast BT1 3BT
Freephone: **0800 917 1297**

Email: **youngscientist@bt.com**

Visit our website at:
www.btyoungscientist.com

A message from

Shay Walsh

What a year it has been so far. I hope you are all settling back into school well and enjoying a return to some degree of normality with your friends after an unprecedented six months.

For us, as organisers of the BT Young Scientist & Technology Exhibition, it's been an equally challenging time, but when looking ahead to the 2021 Exhibition, we were certain of just one thing – the Exhibition had to go ahead, simply because if this pandemic has thought us anything it is that we need innovation in science and technology more than ever before. That is why we are delighted this year, our 57th year, to be bringing the Exhibition to the virtual stage for the first time, giving you, our young scientists, the chance to shine on an even bigger stage than ever before.

Technology enables us to do this and we are looking forward to delivering a world class Exhibition as we do every year but we can only achieve this with your involvement. It is the creative project ideas that our students bring to the Exhibition year after year that makes the BTYSTE the world renowned success that it is and which shines a light on the brilliant young minds that our small country is so proud to call our own.

We need your creativity, your critical thinking and above all your passion to solve the challenges of tomorrow and make the world a better place – be it in the fields of health, climate action, technology or the scientific study of human behaviours.

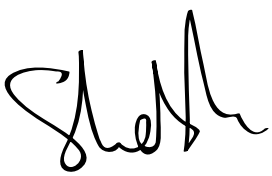
And to the wonderful teachers, the educators of these young minds -you play a crucial role in nurturing and encouraging our young students to shine. I would urge you to be the positive role models our students need in order to be confident in their ideas. Encourage them, guide them and support them.

Within the pages of this fact file you will find everything you need to know about how to enter this year's virtual Exhibition and the reasons why it is so beneficial for both students and schools to get involved.

And as you prepare your project ideas for the 2021 Exhibition, we'll be busy working in the background with our partners, sponsors, our army of BT redcoats and our amazing BTYSTE team to make sure that the 2021 Exhibition goes beyond limits to be the best BTYSTE yet.

Good luck with your projects and we look forward to receiving your entries over the coming weeks.

Go n-éirí libh go léir,



Shay Walsh
Managing Director, BT Ireland

Proud sponsor and organiser of the BT Young Scientist & Technology Exhibition

Teachtaireacht ó Shay Walsh, Stiúrthóir Bainistíochta, BT Éireann – Eagraí bródúil den Taispeántas Eolaithe Óga & Teicneolaíochta BT

A leithéid de bhliain a bhí againn go dtí seo! Tá súil agam you bhfuil sibh ag socrú síos ar ais ar scoil agus go bhfuil sibh ag baint taitneamh as rudaí a bheith normálta ar bhealach éigin le bhur gcairde tar éis sé mhí gan fasach.

Dúinne, mar eagraithe den Taispeántas Eolaithe Óga & Teicneolaíochta BT, am an-dúshlánach a bhí ann freisin, ach agus muid ag féachaint ar aghaidh go dtí Taispeántas 2021, táimid cinnte faoi rud amháin – bhí sé riachtanach go rachadh an Taispeántas ar aghaidh, mar má rá rud ar bith foghlamtha againn ón bpaindéim seo, is é go bhfuil nuálaíocht san eolaíocht agus sa teicneolaíocht ag teastáil uainn níos mó ná riamh. Mar sin, tá áthas orainn i mbliana, ár 57ú bliain, go bhfuilimid ag tabhairt an Taispeántas go dtí an stáitse fíorúil den chéad uair, rud a thugann an deis daoibhse, ár n-eolaithe óga, aicsean a dhéanamh at stáitse atá níos mó ná mar a bhí riamh.

Cuireann an teicneolaíocht ar ár gcumas é seo a dhéanamh agus táimid ag súil le Taispeántas den scoth a sheachadadh mar a dhéanaimid gach bliain, ach ní féidir linn é sin a dhéanamh mura bhfuil sibhse páirteach ann. Is iad na smaointe cruthaitheacha a thugann ár ndaltaí leo chuig an taispeántas bliain i ndiaidh bliana, an fáth go bhfuil clú agus cáil ar BTYSTE ar fud an domhain, agus a dhíríonn aird ar na hintinní iontacha óga atá againn sa tír beag seo.

Tá bhur gcruthaitheacht de dhíth orainn, bhur smaointeoireacht chriticiúil agus thar aon rud eile, bhur bpaisean chun na dúshláin atá romhainn a réiteach agus áit níos fearr a dhéanamh den domhan – cibé réimsí atá i gceist – an tsláinte, an ghníomhaíocht ar son na haeráide, an teicneolaíocht nó staidéar eolaíoch ar iompraíocht an duine.

Agus sibhse a mhúinteoirí iontacha, oideoirí na ndaoine óga seo – tá ról ríthábhachtach agaibhse ár ndaltaí óga a chothú agus a spreagadh. Iarraim oraibh bheith ina eiseamláir dóibh chun go mbeidh muinín acu as a gcuid smaointe féin. Déan iad a spreagadh, a threorú agus a thacú.

Laistigh den chomhad fíricí seo, gheobhaidh sibh gach rud faoi conas cur isteach ar Thaispeántas fíorúil na bliana seo, agus na cúiseanna a bhfuil sé chomh tábhachtach go nglacfaidh daltaí agus scoileanna páirt ann agus conas a rachaidh sé chun leasa gach duine.

Agus sibh ag ullmhú bhur smaointe tionscadail don Taispeántas 2021, beimidne ag obair sa chúlra lenár gcomhpháirtithe, ár n-urraitheoirí, ár slua mór de Chótaí Dearga agus ár bhfoireann iontach BTYSTE chun cinnte a dhéanamh de go mbeidh sa Taispeántas 2021, an ceann is fearr fós.

Go n-éirí an t-ádh libh le bhur dtionscadail agus táimid ag súil bhur n-iontrálacha a fháil sna seachtainí atá romhainn.

Go n-éirí libh go léir,

Shay

A message from

Norma Foley TD

Minister for Education

It is an honour to offer some words of encouragement to you all as you prepare your project ideas for the 2021 BT Young Scientist & Technology Exhibition. Whilst this is my first year as Minister, I am very familiar with the Exhibition and the platform it offers students to express their creativity and talent outside of the classroom.

The BTYSTE has been a cornerstone of the Irish education calendar for an astonishing 57 years, therefore I was delighted to learn that BT is going to continue to deliver the Exhibition in January on a virtual platform so that no student will miss out on this incredible experience.

2020 has been a challenging year for everyone, and the effects of this pandemic will be felt for many months and years to come. But what it has also revealed is that as a society, we are resilient, we are stronger together and that when you combine science and technology with creative and critical thinking, the possibilities are endless.

That is why events such as the BT Young Scientist & Technology are so important. When we look to the future it is to our teachers and students we lean on. You are the change-makers that will define tomorrow's society and the skills you are learning today in school are what will prepare you and equip you for what is to come.

You all have the power to make a difference so I would encourage you to channel that power into your project ideas. Make possible what is not possible, imagine what has not yet been imagined and propose solutions to problems that are yet to be fixed. That's what STEM is all about.

I'm very much looking forward to the first ever virtual BT Young Scientist & Technology Exhibition in January and I'd like to wish the best of luck to you all as you submit your project entries. I'd also like to wish BT, its partners and everyone involved in the organisation of this exceptional event the best of luck over the coming months as they transform this national institution into a virtual festival of science and technology.

Teachtaireacht ó

Norma Foley TD

An tAire Oideachais

Is onóir dom roinnt focal spreagtha a thabhairt daoibh go léir agus sibh ag ullmhú bhur gcuid tionscadal do Thaispeántas BT d'Eolaithe Óga & Teicneolaíocht. Cé gurb í seo mo chéad bhliain mar Aire, tá eolas agam ar an Taispeántas agus ar an ardán a chuireann sé ar fáil sé do dhaltaí a gcuid cruthaitheachta agus tallainne a chur in iúl taobh amuigh den seomra ranga.

Tá an BTYSTE ina chuid lárnach d'fhéilire oideachais na hÉireann le 57 bliain anuas, agus mar sin ba chúis áthais dom a fháil amach go bhfuil BT chun leanúint leis an Taispeántas i mí Eanáir ar ardán fíorúil ionas nach gcaillfidh aon dalta amach ar an taithí iontach seo.

Is bliain dhúshlánach í 2020 do gach duine, agus beidh éifeachtaí na paindéime seo le brath go ceann roinnt míonna agus blianta amach romhainn. Ach nochtann sí chomh maith go bhfuilimid athléimneach mar shochaí, go bhfuilimid níos láidre le chéile agus nuair a nascaítear eolaíocht agus teicneolaíocht le smaointeoireacht chruthaitheach agus chriticiúil, níl teorainn leis na féidearthachtaí.

Sin é an fáth go bhfuil imeachtaí ar nós Taispeántas BT d'Eolaithe Óga & Teicneolaíocht chomh tábhachtach. Nuair a amharcaimid i dtreo na todhchaí is ar ár múinteoirí agus ar ár ndaltaí atáimid ag brath. Is sibhse a athróidh agus a shainmhíneoidh sochaí an lae amárach agus is iad na scileanna atá á bhfoghlaim agaibh inniu ar scoil a ullmhóidh sibh don todhchaí.

Tá sé de chumhacht ag gach duine agaibh difríocht a dhéanamh agus mar sin mholfainn daoibh an chumhacht sin a dhíriú ar bhur gcuid tionscadal. Bain triail as gach aon rud, úsáid bhur gcuid samhlaíochta agus aimsigh réitigh ar fhadhbanna. Sin a bhfuil i gceist le STEM.

Táim ag tnúth go mór leis an gcéad Taispeántas BT fíorúil d'Eolaithe Óga & Teicneolaíocht i mí Eanáir agus ba mhaith liom gach rath a ghuí oraibh go léir agus sibh ag cur isteach bhur gcuid iontrálacha. Ba mhaith liom chomh maith gach rath a ghuí ar BT, a chomhpháirtithe agus gach duine a bhfuil baint acu le heagrú na hócáide eisceachtúla seo sna míonna amach romhainn agus go n-éireoidh leo leis an bhféile fíorúil eolaíochta agus teicneolaíochta.

How it began

The BT Young Scientist & Technology Exhibition is the brainchild of two UCD physics researchers, a Carmelite priest, the Rev Dr Burke, and Dr Tony Scott.

In 1963 these two atmospheric physicists discovered the concept of 'science fairs' while conducting research in Socorro, New Mexico, USA. The local school science exhibitions culminated in state fairs and ultimately a national competition. The pair thought that this hands-on science approach was something that Irish students could really benefit from, by taking science outside the four walls of the classroom and showing that it is all around us.

And so the BT Young Scientist & Technology Exhibition was born. The first competition was held in 1965 in the Round Room of the Mansion House in Dublin and attracted 230 entries. The first ever winner was John Monahan from Kildare. The success and interest in the first event was such that the exhibition moved to the much larger venue of the RDS in 1966 and it has remained there ever since.

The early Young Scientist Exhibition involved individual student competitors, but in 1976 groups were introduced for the first time. Many more developments have happened over the fascinating 56 year history of this national institution, a few key milestones are listed opposite.

Fr Tom Burke in the New Mexico desert

1963 The concept was born at a science fair in New Mexico, USA

1965 First ever Young Scientist exhibition was held at the Mansion House

1972 Schools from Northern Ireland participated for the first time

1976 Group projects introduced for the first time

1977 New range of categories introduced for projects

1983 Participated in International Science & Engineering Fair for the first time

1989 First year of the European Union Contest for Young Scientists (EUCYS), which Ireland has won 14 times!

2002 First year of the Primary Science Fair

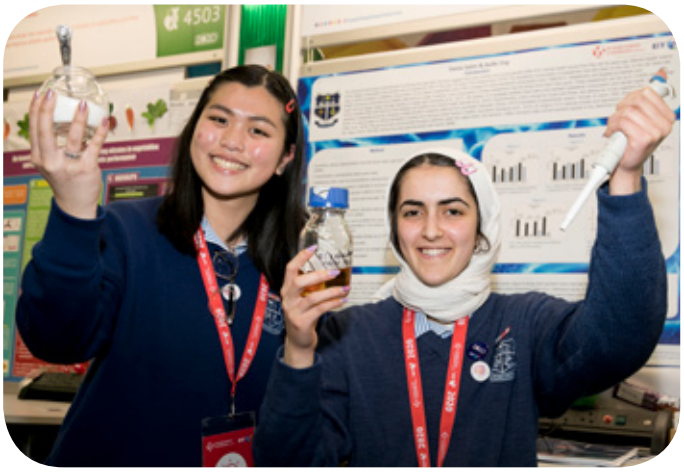
2010 New BT Business Bootcamp launched

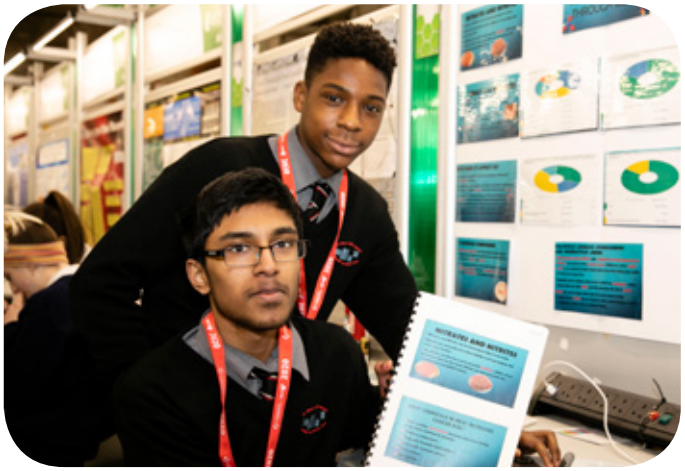
2014 50th anniversary of the Young Scientist & Technology Exhibition

2020 The exhibition will celebrate its 56th year, making it one of the longest standing exhibitions of its kind in the world, and BT's 20th year as sponsor and organiser

2021 Our first ever virtual exhibition


MAIN FINDINGS
I ♥ MATHS
ALGEBRA GENIUS





Awards

Main awards

BT Young Scientist & Technologist(s) of the Year 2021

Individual or Group

- BT Young Scientist(s) of the Year Trophy (perpetual)
- Cheque for €7,500 / £6,750
- The chance to represent Ireland at the European Union Contest for Young Scientists

Best Individual or Best Group

- BT Trophy (perpetual)
- Cheque for €2,400 / £2,160

Runner-up Individual and Runners-up Group

- BT Trophy (perpetual)
- Cheque for €1,200 / £1,080

Please note if the BT Young Scientist & Technologist of the Year is awarded to an Individual, a Best Group Award will also be made.

If the BT Young Scientist of the Year is awarded to a Group, a Best Individual Award will also be made.

Category awards

There are 36 prizes for individuals and 36 prizes for group projects. The prizes take the form of 1st, 2nd and 3rd in Junior, Intermediate and Senior sections of each of the four categories:

Technology
e.g. communications, electronic systems, robotics, computing, control technology, applications of technology, biotechnology, automation.

Biological & Ecological Sciences
e.g. agriculture, anatomy, biochemistry, biotechnology, ecology, horticulture, physiology, medical science, veterinary science.

Social & Behavioural Sciences
e.g. economic, geographical, psychological or sociological studies of human behaviour, nutrition, social anthropology, political science.

Chemical, Physical & Mathematical Sciences
e.g. chemistry, physics, mathematics, applied mathematics, geology, engineering, computer programming, meteorology, astronomy.

The prizes are:

1st prize
€300/£270
for both Individual and Group projects

2nd prize
€225/£202
for both Individual and Group projects

3rd prize
€150 / £135
for both Individual and Group projects

In the event of a tie in any category, the prize money will be split equally. A number of highly commended and display awards will also be awarded in each category by the panel of judges.

Gold Partner awards

Student awards

Analog Devices Student Award

Analog will present an award in the Technology category to the best placed project, either group or individual, except where the project has been selected as BT Young Scientist & Technologist(s) of the Year. The winning project will be awarded €2,000.
In addition, Analog Devices will donate €2,500 to the school of the winning student(s) as a contribution towards its science laboratory equipment fund*.

Perrigo Student Award

Perrigo will present an award in the Biological and Ecological category to the best placed project, either group or individual, except where the project has been selected as BT Young Scientist & Technologist(s) of the Year. The winning project will be awarded €2,000.

RTÉ Student Award

RTÉ will present an award in the Social and Behavioural Sciences category to the best placed project, either group or individual, except where the project has been selected as BT Young Scientist & Technologist(s) of the Year.

CISCO Student Award

An award will be presented in the Chemical, Physical and Mathematical category to the best placed project, either group or individual, except where the project has been selected as the BT Young Scientist & Technologist(s) of the year.

*Analog Devices will contact winner with details, terms and conditions.

Educator of excellence awards

These awards will be presented to the teachers whose commitment and encouragement have consistently enabled their students to participate successfully in all categories of the exhibition.

Analog Devices Educator of Excellence Award - Technology

The winner receives a bursary of €2,000 and an Analog Trophy.

Perrigo Educator of Excellence - Biological and Ecological Sciences

The winner receives a bursary of €2,000 and a Perrigo Trophy.

BT Educator of Excellence - Chemical, Physical & Mathematical Sciences

The winner receives a bursary of €2,000 and a BT trophy.

BT Educator of Excellence - Social and Behavioural Sciences

The winner receives a bursary of €2,000 and a BT Trophy.

Rev Dr Tom Burke bursary

Fr Tom was one of the co-founders of the project and sadly passed away in 2008. In memory of his contribution to the project, a €1,000 bursary is awarded in his name to an individual participant who is deemed by the judges to be the best communicator. This will be paid on application to a student to help them in their second/third level education.

This bursary will be open to participants of all categories across all age groups, but the winner cannot be either the overall Individual Winner or Runner Up.

Special awards

We are proud to have a fabulous range of special awards at this year's Exhibition presented by our partner organisations. Special awards recognise excellence in specific areas. Examples include projects with a focus on innovation in technology, physics, chemistry, sustainability, recycling, the environment, research or improving cancer awareness. Each award is industry-sponsored and details of each organisation and the awards can be found on the Awards section of our website **www.btyoungscientist.com**

The how

This section details the important information on who can enter, how to enter and by when. So the first things to note are the **key dates**:

Closing date for students

22 SEPT 2020

Closing date for teachers

23 SEPT 2020

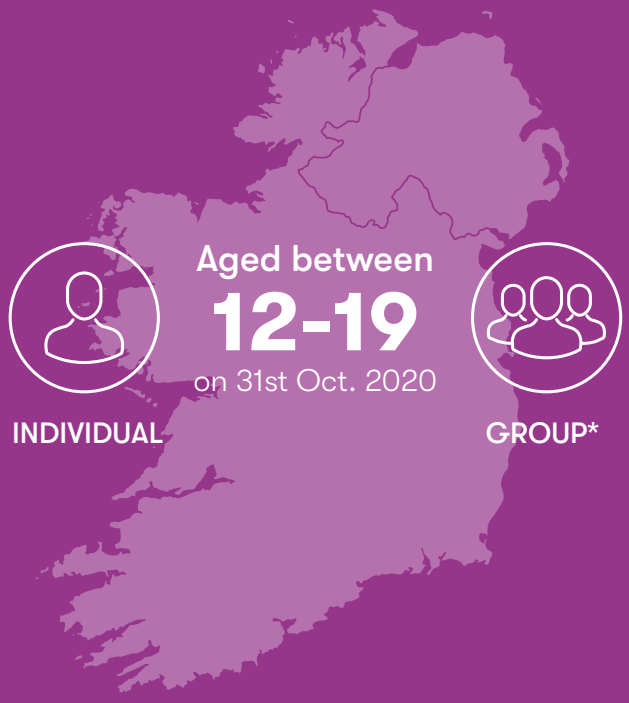
VIRTUAL BTYSTE 2021

6-8 JANUARY

Who can enter

The competition is open to second-level students from Ireland, north and south, who are aged between 12 and 19 years on 31st October 2020.

Please note, students cannot enter if they are due to start University in September.



	JUNIOR	INTERMEDIATE	SENIOR
ROI	1st & 2nd year	3rd & 4th year	5th & 6th year
NI	Year 8, 9 & 10	Year 11 & 12	Year 13 & 14

*A group is defined as comprising of no more than three people from the same school and the same age grouping. If a group is made up of students in different years, these students should be entered into the oldest member's group i.e. If a student in 4th year/Year 12 partners up with a student in 5th year/Year 13 this group should be entered into the Senior category.

The why

If you're wondering why you should get involved in the BT Young Scientist & Technology Exhibition, here are just a few of the **benefits**.

Getting the chance to represent your school/town at the exhibition is a real buzz and an experience you will never forget.

Plus, if you're lucky enough to win, you'll go on to represent the competition at the European Union Contest for Young Scientists.

Although a love for science and technology lies at the heart of all the entries, we're sure everyone also has an eye on the prizes!

There are over 140 prizes to be won, including the prestigious BT Young Scientist & Technologist of the Year Award which comes with a cash prize of €7,500 / £6,750.

It's a brilliant extra-curricular activity to put on your CV or university application.

It shows a real passion for science, maths, an ability to think for yourself along with time management and communication skills.

The rewards aren't just confined to entrants. Teachers will also see real, long-term benefits by getting involved.

It's a great way to get pupils fired up about the vital subjects of science and technology and a brilliant way to showcase your school's scientific pedigree. It also helps to inject a fun element into traditionally 'serious' subjects like science and maths.

Did you know, by participating you could receive a Gaisce (The Presidents Award) or a Duke of Edinburgh Award

more details on our website.

Getting started

To help you decide on a topic, think about what you would like to study. Ideas might come from hobbies or perhaps problems you have observed that need a solution.

Research is the answer

Research is the process by which people create new knowledge about the world in which they live, in order to answer a question or solve a problem. When choosing your topic, give careful thought to how your research might enhance the world and its inhabitants.

Questioning is probably the most important part of scientific creativity and is often followed by an "if...,then..." statement.

Questioning usually leads to observations or experiments.

Initial research

Visit your local library or use the internet to learn everything you can about your chosen subject.

Organise

Organise everything you have learned about your topic. At this point you should narrow your hypothesis by focusing on a particular idea.

Make a timetable

Choose a topic that not only interests you, but also can be done in the amount of time you have. And remember to leave time to write your report and put together an exhibit.

Which category to enter

Please study the definitions closely and be careful to choose the correct project category.

An incorrect choice may result in a project not being accepted (See Rule 1.11).

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.

Social & 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 or perception. The study of attitudes and behaviour in relation to health, nutrition, work, leisure and living habits will also be considered. Projects on consumer affairs, effects on society, social anthropology and political science, provided they involve the use of scientific methods, are also eligible.

Biological & 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 & 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. Projects based on earth and space sciences such as meteorology, geophysics, geology and astronomy are also eligible.

Ask yourself

Before you go any further, ask yourself these questions:

Have you clearly defined the aims of your study?

Have you been able to access the necessary apparatus and equipment?

Has the project been published previously in part or in full?

If so, give details in your project report.

Are you using potentially dangerous chemicals, organisms or equipment in your project?

If so, please discuss with your teacher to ensure that your project adheres to the correct safety regulations.

Have you obtained meaningful results?

Have you been successful with experiments and data collection?

Are you confident that you can complete the project in time for the exhibition?

Has the project been entered in any other exhibition or competition?

If so, be sure to mention this in your entry form for projects and in your project report.

Common mistakes

The judges have identified the most common weaknesses in projects at the initial entry stage. These weaknesses could result in the project **not qualifying** for the exhibition in January. **Please review before submitting your project.**

✖ Lack of original primary research

Some studies are little more than a description of what is already known about the topic. Researching the existing body of knowledge is only the first stage of any scientific study.

✖ Unreliable experimental methods

Frequently, projects state a particular method for data collection, which simply cannot collect the data required. Suppose the aim of the project was to find out which washing powder was most effective. All too often students write that they will gather this information via questionnaire. This only allows them to collect attitudes and opinions about the most effective washing powder, but what is really required for a scientific study is a chemical experiment.

✖ Vagueness/unfocused objectives

A study which aims to find out all about the ozone layer is not a realistic scientific study as no-one could be expected to find this out in the given time. Scientific research requires you to be very specific about what you wish to find out and setting measurable objectives is the only way to present scientific investigation. For example a project that looks at the effects of industrial activity on wildlife would have to focus on a very specific issue, as this topic is so broad. Much thought should be given to which category best suits your project.

✖ Lack of clarity in describing scientific methods

This information should be given on the project details form and/or the one page proposal. The judges need to know exactly what experiments are being carried out, in terms of specific experimental processes, materials or the who and how of a social survey.

✖ Lack of originality

The specific question raised in a project must be one that has not been posed and recorded by any previous scientist. However, this is not to say that twenty projects on the topic of, for example, radon gas or water pollution, could not be original, if they will deal in different ways with different aspects of the topics.

✖ Unsuitability of topic

A topic must be able to be scientifically proven or disproved by research methods available to second level students. A project on whether or not Jupiter is inhabited by living creatures is really not a suitable topic.

✖ Lack of scientific content

Often proposals are submitted that are not scientific projects, but literature reviews. These proposals are information collection exercises and not scientific studies.

✖ Safety issues

Projects which put the students themselves or others at risk of physical injury or disease will not be accepted for the Exhibition.

✖ Ethical issues

Projects which put the students or others at risk psychologically or emotionally will not be accepted for the Exhibition.

✖ Investigation period

Sometimes students propose a project that is weak because the period over which the project is being carried out is too short. Judges need to be convinced that the student has enough time to complete the project for the Exhibition.

550 **project places** will be available for the Exhibition next January. However, each category is allocated a finite number of places based on the number of projects entered in that category. It is possible that some projects may not qualify if the quota for a category has been filled with higher ranked projects.

Online application

You must include:

Entry form for projects (completed by students)

In addition to other information, you will give your project a title on this form. The project title should accurately reflect the scientific content of the project. Avoid using what you may think is a smart or catchy title; such titles are generally misleading and do not necessarily impress the judges. The title you choose is the one that will appear on your stand, should your project progress to the exhibition.

Project details form (completed by students)

On this form you should detail your project, how you intend to approach it and the work you have carried out to date.

One page proposal (completed by students)

This very important document forms a crucial part of the process by which the screening judges decide whether your project is accepted or not. It should explain to the judges what your project is all about and will help them decide whether or not you have already carried out some research. Care should be taken in preparing your proposal.

More information on how to complete your one page proposal and examples can be found online at **http://btyoungscientist.com/submission-process/**

Teacher assessment form (completed by teachers)

This needs to be completed online by teachers by Wednesday 23rd September.
Late entries will not be accepted.

N.B. Requests for accommodation grants (where appropriate), must be made on the Teacher Assessment Form at the time of entry.

Closing date for students

22 SEPT 2020

Closing date for teachers

23 SEPT 2020

Already entered a science or technology competition?

If your students have already completed projects in another science/technology/ innovation/entrepreneurship competition, why not get some more mileage from them and enter the BT Young Scientist & Technology Exhibition?

Who knows? You could already have the winning project.

All you have to do is tick the appropriate box on your Entry Form for Projects.

Good luck!

Timescales

"Sounds great, but we wouldn't have the time...."

A common misconception regarding the BT Young Scientist & Technology Exhibition is the enormous, unmanageable, and overwhelming time commitment required. And it is exactly that - a misconception.

Additional Tips

- Some of the work could potentially be completed during class time
- Time at school science clubs could be used to work on projects
- Good planning across the 14 weeks between the closing date and the exhibition can ensure the work is manageable

Here is a clear guide to exactly what is required and by when...

22 SEPT 2020

Closing date for students

Required:

- One page proposal, entry form for projects & project details form (completed by the student)

23 SEPT 2020

Closing date for teachers

- Teacher assessment form (completed by the teacher)

1 NOV 2020

Beginning of November - Results published

This is when you find out if your school projects have made it through to the final exhibition.

Completed confirmation forms should be returned by 9th November 2020

6-8 JAN 2021

The Exhibition

Required:

- Completed visual display, project report book and project diary

That's 14 whole weeks to get projects ready for the exhibition in January!

What happens next?

Your entry is considered by a panel of screening judges who carefully consider every project. Following their decision, you will be informed whether or not your project has qualified.

The judges may also request further information at this stage. This screening process should take around four weeks to complete, so please be patient.

QUALIFIED

Teachers will receive an email confirming that the judges have accepted the project. This will also contain more details of the exhibition. Results will also be posted to the home address of the lead student alongside entry forms which must be completed to accept your place.

QUERIED

If your project is queried, the judges will send you or your teacher an email. With your teacher's assistance you must answer this query as soon as possible.

NOT QUALIFIED

The judges may decide not to accept a project. This means that you will not present your project at the Exhibition in January. The reason for non-qualification is sent by email to your teacher. You will also receive a letter notifying you of this decision.

N.B. The submission of a project does not automatically mean that the project will qualify for the Exhibition in January. The judges' decisions are final in all cases and neither BT nor its employees have any influence.

Good scientists use a process to study what they see in the world.

As a scientist you should learn to be sceptical about all research results, especially your own.

A good experiment may or may not answer the questions asked, but almost always leads to fresh questions which require new experiments or observations. The final hypothesis is often developed after you have run a number of preliminary experiments, analysed a body of results, and reached a tentative conclusion. By following the six stages listed below, you should be able to produce a superior scientific project.

Be curious, choose a limited subject, ask a question, identify or originate/define a problem

Review published materials related to your problem or question

Evaluate possible solutions and make your educated guess (hypothesis)

Challenge and test your hypothesis through experimentation (data collection) and analysis

Evaluate the results of your experiment and reach conclusions based on your data

Prepare your report and exhibit

Data collection

Data can be collected in four ways

1 Documentary sources

Documents can be used to set an idea in a historical context or as the basis for an entire study.
A wide variety of documents can be used, e.g. the Census of Population (available from the Central Statistics Office), personal documents, photographs and maps.

2 Observations

This is one of the primary methods of collecting data, but care must always be taken to ensure that the data is observed in an unbiased way.

The observer's senses may not be able to record everything. Also, if the observer is watching people, animals or other organisms whose behaviour changes because they are being observed, the results may be invalid.

3 Surveys

Questionnaires, interviews and schedules are some of the techniques used in conducting survey work. Questionnaire design merits great attention. It is very important to think through how you are going to analyse the results you will get. Your questions should be clear, concise and should gather the relevant information.

4 Tests, measurements and experiments

These should only be used if they are relevant to your research and if you are capable of doing and understanding them yourself. Particular attention should be given to the design of experiments, the requirement for controls, sufficient replication and repeat experiments where appropriate. Ensure that any testing or experimentation you undertake is not dangerous i.e. it does not put yourself or others at risk of injury or disease.

Guidelines on sampling

Remember to use a representative sample.

Random sampling
A random sample means that every member of a population had an equal chance of being chosen, e.g. pulling numbers from a hat.

Case studies
These look at a small number of individuals and a particular context in depth, may be useful in helping us understand how a particular process works.

Stratified sampling
The idea of using groups or classes within the population being analysed.

Quota sampling
If you want to interview, for example, 200 people about shopping, you could go to a particular part of town where you could meet shoppers.

Systematic sampling
A systematic sample takes every "nth" member from a population.

Guidelines on statistics

What techniques can you use to analyse data?

You could summarise your data
This procedure means what it says. It is a way of reducing the bulk of data to a more manageable size, as well as seeing some patterns emerging.

You could try to explain patterns which emerge, using comparison techniques
These techniques are widely used to compare variables.

You could carry out a significance test e.g. a t-test
Significance tests are used to make sure that results from comparing data sets are not the result of chance.

Important information

please read carefully

Plagiarism

Plagiarism is using others' ideas or words without clearly acknowledging the source of that information.

You must give credit to sources whenever you use:

- ✓ **another person's idea, opinion, or theory**
- ✓ **quotations of another person's actual spoken or written words**
- ✓ **any facts, statistics, graphs, drawings or any piece of information that is not common knowledge**
- ✓ **paraphrase of another person's spoken or written words**

These guidelines apply irrespective of the source of the information. Plagiarism of any kind will result in immediate disqualification from the competition (see Rule 1.13 on Page 36).

Ethics

Scientific and technological investigations and applications must be undertaken with integrity through the use of rigorous methods.

Participating students must ensure that the involvement of people in their research is always fully justified and if so, there is a duty to protect the wellbeing, dignity and privacy of those individuals. The welfare of any animals subject to investigation must always be respected and likewise, any experimentation carried out in the natural environment must avoid having adverse impacts.

Patents

Is your invention patentable?

The vast majority of students taking part in the BT Young Scientist & Technology exhibition will not need to consider applying for a patent.

However, if your project comprises functional or technical aspects that are new and not an obvious development on what already exists, you might consider applying for patent protection.

For an invention to be patentable it must be:

1. **Totally new**
   Search using free patent databases like Espacenet or Google Patent, or even search sites like Google or Yahoo.
2. **Not obvious to a person who works in the technology field**
   (usually an improvement with surprising benefits)
3. **Capable of industrial application**
   (e.g. manufacture)
4. **Not be part of an excluded category**
   (e.g. equipment specifically designed for human or animal torture)

Prior to making a patent application, you must not make any public disclosure of your idea/invention, or put it into use publicly, e.g. at BTYSTE. The patent application itself must be the first public disclosure of the invention. Any prior disclosure of the invention will count against the invention being considered new, and could result in the patent being invalid.

If an invention is in the public domain it is considered 'prior art' and no longer patentable in most countries including the UK and Ireland.

But please remember that there are costs involved should you decide to apply for a patent.
These initial costs are:

- The basic patent office fees (a few hundred euro/ pounds depending on where you file the patent application e.g. the Irish Patents Office or UK Patent Office). The Irish Patents Office charges €125 to file a standard patent. It would cost a minimum of €550 to get it to the grant phase.
- The optional, but advisable, patent attorney fees can add up considerably (these fees are usually thousands, rather than hundreds). Invention disclosure forms can help reduce these costs.

More information - www.patentsoffice.ie

External help - is it allowed?

It is expected that all or the majority of the work for a project will be conducted either in the school, home or the outside environment. Understandably, some projects may involve visiting distant locations.

Students may seek advice or information about their project from sources beyond their school, such as on the web, government organisations, universities, institutes of technology or other experts. However, it is recommended that the majority of students' work should be conducted under the supervision of their relevant teachers with, where appropriate, suitable levels of involvement by parents, guardians or other responsible adults.

Where experimental/research work is conducted by the students themselves, or on their behalf, in a laboratory that is external to their school (e.g. in a local university, a hospital or an industry) then that work should be clearly identified and acknowledged within the project report book and presentation.

In addition, it is a requirement that a cover letter from the external facility, describing the extent of the assistance provided and the work done by the students within that facility or undertaken on their behalf, will be included in the project report book.

GAISCE The President's Award

Put your BTYSTE project work towards a Gaisce Award!

The BT Young Scientist & Technology Exhibition is an official Gaisce Challenge Partner. Are you over 15 and taking part in BTYSTE this year? Does your school, or an organisation you're involved with, offer Gaisce – The President's Award?

Make the most of your BTYSTE project work by putting it towards the Personal Skills challenge area, one of four areas you will undertake as part of the Gaisce programme.

Gaisce is a personal development programme for young people aged 15-25 that encourages you to find your passion, get active and make a difference in your community!

For further information

visit www.gaisce.ie/btyste or ask the President's Award Leader (PAL) at your school.

Your project

The THREE main elements

When waiting to hear if your project has qualified it is important to continue working on your project.

Project Diary

All entries must keep a diary which should contain:

Day-to-day records of how the project is progressing, a full record of the names of sources you have looked up and all the people/institutions you have contacted. Record everything in your diary and use it as an information store for writing your report. You can write personal comments about how your project is progressing.

If you are working as a group, appoint a leader who should keep all relevant information and appoint a group member to keep the diary.

Visual Display

Your display is a summary of your project. Do not try to display your entire project, cover just the main points and highlights.

Plan your display well in advance. Use a plan to help you make the best use of your space. Work out the dimensions of everything you want to include. How your project is displayed on your stand will be taken into consideration by the judges when reaching their decision.

When finalising the planning of your display, ask yourself:

Will the judges/visitors be able to move through my project, step by step, from background onto methods and from there to results and conclusions? Is the text big enough to be easily read by both the judges and the public?

Project Report Book

Your report book should be no more than 50 pages of text (typed) plus appendices and references. It should be organised under the following sections:

- **Title page**
  This contains the names of the project, school and student(s).
- **Comments page**
  A page which may be signed by a judge.
- **Contents page**
  Includes the sections and page numbers of the report.
- **Summary/Abstract**
  Essential part of your project. It should be about two pages long and include a short summary of your project.

  When someone reads this summary they should understand what you were setting out to achieve and what your main results and conclusions are.
- **Introduction**
  This should set the scene for your report. Why did you do the project and what did you hope to achieve?

  In this section you should also refer to surveys, experiments, questionnaires and the part they played in your project. Make sure you refer to previous research in this area.
- **Experimental methods**
  This section should describe the experiments you carried out. Keep in mind the value of diagrams and illustrations.
- **Results**
  You should include a good sample of your measurements and all of your important results in this section. You can include the bulk of your readings and measurements in appendices.
- **Conclusions and recommendations**
  Comment on the results of your work in this unit, be CLEAR and CONCISE.

  How...
  ..does your work compare with existing theories?
  ..accurate is the data you got from your study?
  ..might your work be extended and improved?

  What...
  ..are the strong and weak points of your methods?

  Does...
  ..your project contribute to scientific knowledge and research?
- **Acknowledgements**
  At the end of your report, acknowledge any help you received during the project for example, teachers, companies, institutions and parents.
- **Appendices**
  Additional information, reports and any letters/ correspondence.
- **References**
  List any books, articles, web pages and references that helped you in your project.

Your project

Helpful hints for a good display

1

A good title

Your title is an extremely important attention-grabber, which should simply and accurately present your research. The title should make the casual observer want to know more. Ensure you do not use brand names in your title.

2

Take photographs

Many projects involve elements that may not be safely exhibited at the exhibition, but are an important part of the project. Take photographs of important parts/phases of your experiment to use in your display. (Photographs or other visual images of human test subjects must have informed consent.)

3

Be organised

Make sure your display is logically presented and easy to read. A glance should permit anyone (particularly the judges) to locate quickly the title, experiments, results and conclusions. When you arrange your display, imagine that you are seeing it for the first time.

4

Eye-catching

Make your display stands out. Use neat, colourful headings, charts, and graphs to present your project. Homebuilt equipment, paper and use of colour are excellent for project displays. Pay special attention to the labelling of graphs, charts, diagrams and tables, each item must have a descriptive title. Anyone should be able to understand the visuals without further explanation. Make sure that the text is large enough to be read easily.

5

Correctly presented

Be sure to adhere to the size limitations and safety considerations when preparing your display. Make sure your display is sturdy, as it will need to remain intact for quite a while. Do not hesitate to ask for advice from adults if you need it. It is very important to check the spelling!

Carrying out the work

You now know what the project requires, here are some guidelines on carrying out the work involved.

Before you go any further ask yourself these simple questions:

- **What am I trying to find out?**
- **How am I going to do this?**
- **Where can I get the help I need?**
- **What do I expect to find out at the end of my research?**
- **Have I access to the apparatus or equipment to carry out the work?**

Once you are satisfied that you can really get to grips with your project, then you enter the planning stage. Remember, only a few scientific discoveries are the result of chance or luck. The rest are the result of dedicated thought and experimentation.

Read background material and literature

The advice here is read, read and then read some more! This will give you real insight into your topic. Background material can be obtained from books and journals and by using the internet. Remember to keep a record of this in your project diary.

Plan your research and design

Decisions need to be made on which experiments you will conduct, how you will design your apparatus and, if applicable, how you will collect your data.

Carry out your research

Record each and every measurement, experiment or observation. At this stage, your project may fail completely. If so, it is still important to record and report the failure. Remember a null result is still a scientific finding and an important guide to other scientists. Record all your observations and findings.

Analyse your results

After you have completed all of your research, you need to examine and organise your results. Focus on how your results relate to your original topic and its objectives. Good results merit good presentation.

Make your conclusions

You are now ready to develop a theory to explain your findings. Keep an open mind on the results you get and the conclusions you reach.

Evaluate your project

You are now in a position to make recommendations and perhaps contribute through these to scientific knowledge.

Ask yourself the following questions:

- **Did you succeed in researching your topic?**
- **Do your conclusions support your original hypothesis?**
- **Have you added to the body of knowledge through your research?**

The virtual exhibition

Preparing for the judging

Judges look for well thought out research. They look at how significant your project is within its field, and how thorough your research was. Did you leave something out? Did you start with four experiments and finish with only three?

Good communication

Judges applaud those students who can speak freely and confidently about their work. They are not interested in memorised speeches - they simply want to talk with you about your research to see if you have a good grasp of your project from start to finish. Besides asking the obvious questions, judges often ask questions to test your insight into your projects such as 'What was your role?', 'What didn't you do?' and 'What would be your next step?'

Remember a little enthusiasm goes a long way!

The judges will also look for:

- Creative ability
- Thoroughness
- Skill
- Teamwork
- Scientific thinking and approach
- Clarity

Judges focus on:

- How well you followed scientific methodologies
- The detail and accuracy of research as documented in your report book and diary
- Whether experimental procedures were used in the best possible way

Tips from the judges:

When it comes to being successful at the BT Young Scientist & Technology Exhibition, there really is no substitute for hard work. That being said, we want to give you as much help as we can along the way. The following advice and tips from our panel of judges might make your job a little easier.

1. **Start to work on your project as soon as you can.**
   Some projects can take a lot longer to complete than you envisaged when you started.
2. **To succeed, you have to be interested and involved from the word go.**
3. **Don't leave things to chance or guesswork.**
   Research your project well. That way you'll be able to deal comfortably with any queries that come your way from the judges or members of the public.
4. **Keep a detailed project diary of your work.**
   We all forget things and this may help you answer judging queries at a later date.
5. **Accurate use of scientific methods counts for a lot when judging begins, so take your time and make sure that all your facts and figures are correct.**
   Don't be afraid to ask your teacher when unsure about something.
6. **The project title should accurately reflect the aims of the project.**
7. **Be original.**
   Make your project stands out from the crowd by giving solid reasons for your choice of subject.
8. **Make your exhibit as attractive as possible.**
   Presentation may not be everything but clear, concise work shown in an attractive manner can only benefit you when judging takes place.

BT YS Business Bootcamp

Programme for students

A number of the exhibiting intermediate and senior students from the 2021 BT Young Scientist & Technology Exhibition will be invited to take part in a BT Young Scientist Business Bootcamp in February/ March next year where they will experience the world of technology commercialisation and entrepreneurship.

We have created this programme to encourage further innovation by our young scientists and provide them with commercialisation skills to carry forward into their careers and lives. The bootcamp will be held at University College Dublin (UCD).

UCD DUBLIN

in association with UCD Innovate

THE BT YOUNG SCIENTIST
BUSINESS BOOTCAMP
Driven by innovation, delivered by BT

Expanding Business Leadership

As an extension of the BT Young Scientist & Technology Exhibition, the BT Young Scientist Business Bootcamp has enabled BT to take a national leadership role in economic development. BT is collaborating with key private and public sector organisations to create an opportunity to mentor the next generation of Irish innovators and entrepreneurs.

Igniting Entrepreneurial Spirit

We at BT believe that the BT Young Scientist Business Bootcamp helps to bridge the gap between the worlds of education and business and mentor the next generation of young innovators and entrepreneurs.

> The Bootcamp experience has been life changing. I feel it has really opened up doors for me in regards to career options, developing my project and communicating better with people. I have met and heard from some amazing and inspiring people and I feel I have become more creative and innovative in the way I think.

Rules

Rules of Entry Applicable to the BT Young Scientist & Technology Exhibition 2021 (the "Exhibition").

Rules are correct at time of print, final rules in relation to the exhibition can be found at **www.btyoungscientist.com/rules**

The following rules are designed to ensure that the BT Young Scientist & Technology Exhibition is conducted as fairly and as efficiently as possible and are subject to change at any time at the sole discretion of BT. Infringement of any of the rules listed below may lead to exclusion, at any time, of individuals or schools from present and/or future participation in the BT Young Scientist & Technology Exhibition.

BT will and requires that participants will at all time comply with HSE Guidelines as may be issued from time to time during the Covid-19 pandemic, and reserves the right to make changes at any time to the below rules as may be necessary to ensure such compliance.

1. General rules

1.1 The BT Young Scientist & Technology Exhibition is organised and sponsored by BT Communications Ireland Limited ("BT") whose decision on all matters relating to the Exhibition will be final.

1.2 Entries and all associated paperwork must be submitted on-line in accordance with the instructions set out on the entry form. Postal entries will not be considered.

1.3 The closing date for receipt of on–line entries is by midnight on Tuesday 22nd of September 2020 for students and by 5pm on Wednesday 23rd of September 2020 for teachers. Under no circumstances will late entries be accepted.

1.4 Second Level students aged between 12–19 years on 31st October 2020, resident in any part of Ireland, are eligible to enter.

1.5 Students can only win the title BT Young Scientist(s) & Technologist(s) of the Year once. Previous winners of the title are not eligible to re–enter the competition in subsequent years.

1.6 Projects that have been entered in other competitions can be accepted as entries to the BT Young Scientist & Technology Exhibition, provided that this information is stated in the relevant area on the entry form and provided there is no 3rd party restriction on entry.

1.7 Submission of an entry will not ensure the acceptance of a project for the Exhibition. A panel of screening judges will select the projects to go forward for the Exhibition and their decisions are final. The Exhibition will take place virtually in 2021 and to take part, candidates must accept and comply with the Virtual Exhibition Rules which will be made available on notification of acceptance.

1.8 Students educated at home in the Republic of Ireland, i.e. not attending a registered school or college, are eligible to enter, provided that they are registered with the National Education Welfare Board (Republic of Ireland) and supply a copy of the registration certificate with their entry form. Students from Northern Ireland in similar circumstances should telephone 0800 917 1297 for guidance.

1.9 Entries can be made in the following three age groups:

• Junior • Intermediate • Senior

Age group is determined by the year in which the student(s) is studying at the time of the Exhibition (January 2021) and as specified in page 12 of the Factfile.

1.10 Students attending Primary Schools or Third Level Colleges are NOT eligible to enter.

1.11 Projects can be submitted in one of the following four categories by 22nd September 2020:-

1. Biological & Ecological Sciences
2. Chemical, Physical & Mathematical Sciences
3. Social & Behavioural Sciences
4. Technology

1.12 Notwithstanding the classification a student(s) assigns to its project, the judges will have the right to decide its appropriate classification.

1.13 Plagiarism is prohibited. Plagiarism is the presentation of someone else's work as a student's own without appropriate attribution. Whether done deliberately or inadvertently it is unacceptable and applies not just to text, but to graphics, tables, formulae or any representation of ideas in print, electronic or any other media in addition to computer software and algorithms, which could be implied as being the work of the student. As part of the application students are required to sign a

declaration that the project is wholly their own work except where this is clear acknowledgment and appropriate reference to the work of others. To maintain the integrity of the competition, where the judges suspect plagiarism they are entitled to exclude a project at any stage of the competition and the student(s), the student(s)'s parents, and/or the student(s)'s school may be notified.

Individual/group projects

Projects must be submitted as either an Individual or Group Project.

1.14. A student may only enter one project into the competition, whether they are entering as an individual or as part of a group.

1.15 Individual projects may be submitted in any one of the four categories specified at 1.11 above (see also Factfile page 15 section 'What category to enter') and once submitted cannot be re–classified as a Group Project. In addition, if a student enters an individual project which fails to qualify they are not eligible to transfer to a qualified group project at any time.

1.16 Group Projects may be submitted in any one of the four categories specified at 1.11 above. Groups will consist of either two or three members, where possible in the same age group (Junior, Intermediate or Senior), who must be from the same school. Once a project has been accepted as a Group Project and has qualified to compete in the RDS, it cannot be re–classified as an Individual Project. In cases where groups are constructed from students who are not in the same age group, the age category in which the project is entered must align with the age group of the oldest student.

1.17 Each group must appoint a group leader who will direct the work and later act as a spokesperson. All group members must fully participate at the Exhibition and in judging interviews, in accordance with the processes set out in the Virtual Exhibition Rules.

1.18 All members of a group should be fully involved, share the work and be familiar with everything that is presented in the report book and poster. The final work should reflect the co–ordinated efforts of all group members.

1.19 In exceptional circumstances groups may wish to decrease or increase the number of people participating in their accepted Group Project team. Any such proposed changes need to be submitted in writing to BT before the 1st December 2020 detailing the proposed change(s) and the exceptional circumstances necessitating them. Failure to do so will lead to the proposed changes being rejected and the project being judged in the original grouping in which it was entered. BT's decision as to whether such changes are acceptable will be final.

1.20 Students whose projects involve studies of live animals must ensure that such studies are carried out in accordance with the statutory regulations. Copies of the regulations are available from the Department of Health, Custom House, Dublin 1. Visit http://health.gov.ie/blog/statutory-instruments/european-communities-amendment-of-cruelty-to-animals-act-1876-regulations-2002/ or http://ec.europa.eu/food/fs/aw/aw_legislation/scientific/86-609-eec_en.pdf.

BT reserves the right at its sole discretion to exclude any such projects from the Exhibition.

1.21 The nature of a project will determine the equipment used in the project. The merit of a project will lie in the use made of scientific apparatus and in an exhibitor's understanding of its functions, not in the equipment itself.

1.22 Before a project involving potentially dangerous, pathogenic, toxigenic or allergenic organisms (animals/insects, plants or microorganisms) is undertaken/entered, a competent expert must be consulted to advise on health and safety issues. The potential use of any such organisms must be clearly identified on the Project Details Form, and the advice of the competent expert who has been consulted made available for review by BT on request. BT reserves the right at its sole discretion, to exclude any such projects from the Exhibition.

1.23 Projects involving the use of chemicals must list those to be used as part of the exhibit in the RDS in the Project Details form. BT reserves the right at its sole discretion, to exclude any such projects from the Exhibition.

1.24 It is expected that all or the majority of the work for a project will be conducted either in the school, home or the outside environment. However we understand that some projects may require visiting distant locations. Students may seek advice or information about their project from sources beyond their school, such as on the 'web' or from government organisations, or from universities, institutes of technology or other experts. However, the majority of students' work should be conducted under the supervision of their relevant teachers, with, where appropriate, suitable levels of involvement by parents, guardians or other responsible adults. Where experimental /research work is conducted by the students themselves, or on their behalf, in a laboratory that is external to their school (e.g. in a local university, a hospital or an industry) then that work should be clearly identified and acknowledged within the project report book and presentation. In addition, it is a requirement that a cover letter from the external facility, describing the extent of the assistance provided and the work done by the students within that facility or undertaken on behalf of the student(s), will be included in the project report book.

1.25 A student may be part of only one project. If a student having entered a project has not qualified they cannot be added to a qualified group project at any time.

2. Qualified projects

Applicable only to projects qualifying to exhibit at the Exhibition. Please note that due to the virtual nature of the 2021 Exhibition, additional 'Virtual Exhibition Rules' must be accepted by qualifying projects before they can take part in the Exhibition. These will be provided on notification of qualification.

2.1. Some students who have had their project accepted for exhibition may find themselves unable to complete it. It is very important that the organisers are immediately notified of this. If a project has to be withdrawn the organisers must be notified immediately by e–mail at youngscientist@bt.com.

Schools failing to notify the organisers of a withdrawal in writing, a minimum of two weeks in advance of the Exhibition, will be liable to a charge of €100 to cover administration costs.

2.2 Project content and material remains the property of the exhibitors but may be used by BT for exhibition or publication, and will be exhibited virtually at the Exhibition.

If students have a project with elements that have commercial potential, it is recommended that they consider patent protection. Please see the BT Young Scientist & Technology Exhibition website and Factfile for further information on patents.

2.3 Projects shown at previous BT Young Scientist & Technology Exhibitions will not be accepted unless the project has undergone significant further development. Projects that represent a continuation of previously entered work in the BT Young Scientist & Technology Exhibition should have a significant amount of new material. Previously presented data must be clearly indicated as such in the report books and in the display.

2.4 The Overall BT Young Scientist(s) of the Year may not represent any other country or organisation in respect of this science/technology project until the following year's prizewinner(s) are announced. The BT Young Scientist(s) may not represent themselves as BT Young Scientists at any time without the prior written consent of BT.

2.5 The Overall BT Young Scientist(s) of the Year will be the only project that will be eligible to be entered by the National Organiser for Ireland in the EU Young Scientist competition each year.

2.6 The judges reserve the right to withhold awards in the event of projects not reaching a satisfactory standard.

2.7 If a project has not adhered to all the rules and regulations of this competition, the judges have the right to withhold awards or exclude the project at any stage during the judging process.

2.8 The judges' decision in all matters relating to the award of prizes will be final. BT and other sponsors will have no input into the judges' decisions.

3. BT Young Scientist Business Bootcamps

If a project is to be included in these programmes then the student must indicate this by ticking the opt in box on the project details form. Failure to do this will mean exclusion of the projects for consideration from the Business Bootcamp programmes.

4. Prize money

4.1. Prize money will be paid by cheque to the successful individual or to the team leader and posted to the home address listed on BT's database. BT shall endeavour to pay prize money in accordance with and subject to these rules on or before 30th March 2021 but BT shall have no liability for failure to pay prize money on or before such date.

5. Privacy (Content, Photography and Film)

5.1. BT will comply with its obligations as a data processor in accordance with the General Data Protection Regulation (GDPR) and the Data Protection Act 2018. BT will use your personal information only as set out in our privacy notice which you can find here www.btyoungscientist.com/privacy.

If you have any further questions or comments concerning your privacy, wish to access your personal data held about you, delete, or update information we hold about you, the relevant details are here http://www.btireland.com/privacy.

5.2 The BT Young Scientist & Technology Exhibition will be operating the Exhibition on a virtual basis, using a platform that has restricted access for participants, media and members of the public. BT reserves the right to upload and manage content on the platform in any manner it requires, including using project information, video footage, photographs and all other content, in accordance with our privacy notice. Further detail will be included in the Virtual Exhibition Rules.

5.3 Such content may be used on the BTYSTE website and for BT marketing purposes in accordance with our privacy notice.

N.B. BT is under no obligation to make use of any content provided.

5.4 BT also retains the right to publish information in regards to all projects entered into the BT Young Scientist & Technology Exhibition in accordance with our privacy notice.

5.5 As media partner of the BT Young Scientist Exhibition, RTÉ may record interview and film footage for use on its broadcast channels, online, in social media and for marketing purposes. Candidates may be required to complete an RTÉ release form prior to the Exhibition, with parental consent required in respect of minors under the age of 18.

6. Intellectual property rights

6.1. All intellectual property rights either pre-existing or created in relation to or as part of the Exhibition shall remain the absolute property of that party or its licensors.

6.2 BT may pass contact details of all qualified projects to The Patents Office. The Patents Office will mail individuals directly in relation to Intellectual Property Rights.

7. European Union Contest for Young Scientists (EUCYS)

7.1 The host country for EUCYS will pay the travel and accommodation expenses of qualified contestants.

7.2 The host country for EUCYS will pay travel and accommodation expenses of one adult escorting person per country. For the Irish delegation this will be the Irish National Organiser, who is the head of the BT Young Scientist & Technology Exhibition. Any others that wish to travel to EUCYS will travel solely and fully at their own expense.

DRIVEN BY I

1965
John Monahan

1966
Máire Caitríona Ní Dhomhnaill / Mary Finn

1967
Walter Hayes R.I.P.

1968
George Andrew Reynolds

1969
Luke Drury

1975
Noel Boyle

1976
Mary Kelly-Quinn

1977
Micheal Og O'Briain

1978
Donald P McDonnell

1979
Jervis Good

1980
Karen Ruddock

1987
Emma Donnellan, Henry Byrne

1988
Siobhan Lanigan O'Keeffe

1989
Grace O'Connor, Sinead Finn

1990
Anna Minchin-Dalton

1991
Barry O'Doherty, Daniel Dundas

1992
Elizabeth Dowling, Jean Byrne R.I.P.

1999
Sarah Flannery

2000
Thomas Gernon

2001
Shane Browne, Peter Taylor, Michael O'Toole

2002
David Michael O'Doherty

2003
Adnan Osmani

2004
Ronan Larkin

2011
Alexander Amini

2012
Eric Doyle, Mark Kelly

2013
Ciara Judge, Emer Hickey, Sophie Healy-Thow

2014
Paul Clarke

2015
Ian O'Sullivan, Eimear Murphy

NNOVATION

1970
Maria Edgeworth

1971
Peter Short

1972
Seán Mac Fheorais

1973
Tadgh Begley

1974
Richard Elliott

1981
Catherine Conlon

1982
Martynn Sheehan

1983
William Murphy, Gareth Clarke, Turan Mirza

1984
Eoin Walsh

1985
Ronan McNulty

1986
Breda Maguire, Niamh Mulvaney

1993
Donal Keane, Rodger Toner

1994
Jane Feehan

1995
Brian Fitzpatrick, Shane Markey

1996
Elsie O'Sullivan, Rowena Mooney, Patricia Lyle

1997
Ciara McGoldrick, Emma McQuillan, Fiona Fraser

1998
Raphael Hurley

2005
Patrick Collison

2006
Aisling Judge

2007
Abdusalam Abubakar

2008
Emer Jones

2009
John D. O'Callaghan, Liam McCarthy

2010
Richard O'Shea

2016
Diana Bura, Maria Louise Fufezan

2017
Shane Curran

2018
Simon Meehan

2019
Adam Kelly

2020
Alan O'Sullivan, Cormac Harris

BT is one of the **world's leading providers of communications services and solutions**, serving customers in 180 countries. Every day, we touch the lives of thousands of people on the island of Ireland, helping them communicate, collaborate, and be entertained and informed.

Innovation

At BT, we can trace our roots back to the very first communications company, the Electric Telegraph Company, founded in 1846.

For more than 170 years, technologies pioneered by BT have truly built the modern world, and in that time, we've never stopped innovating.

In 1984 our research team perfected the use of single mode optical fibre. Today this technology plays a role at the heart of all global networks, including our own – a network that reaches customers in more than 180 countries. Now, we've over 14,000 scientists and technologists working for us around the world, and have invested €2.8 million in research and development in the past five years.

BT's global presence means that we innovate globally too. Our worldwide scouting network, combined with strong relationships with leading universities, allows us to find the best innovations from across the globe, blend them with our own capabilities and in-house research, and create new possibilities for our customers.

That's why we are so proud to organise the BT Young Scientist & Technology, for 20 years, to increase youth engagement in science and technology, and give them a platform to showcase their innovative ideas nationally and internationally.

BT in Ireland

BT Ireland is the trusted provider to some of the world's biggest multi-national corporations and indigenous exporters. Our job is to help them solve and manage their complex communication needs using our global network. Every day, we process millions of transactions through our state-of-the-art data centres, develop agile contact centres, pre-empt and solve emerging cyber threats, build networks for other communications companies and more. We also serve major public sector organisations, operating the 999/112 emergency call answering service on behalf of the Irish state.

Sustainability in BT

Our purpose is to use the power of communications to make a better world, by connecting people and society, protecting the environment, maintaining a healthy, progressive workplace and by using our skills and resources to benefit good causes throughout our communities.

Last year, BT Ireland employees spent more than 12,700 hours volunteering across the island of Ireland. Our annual BT Shop for Change campaign has raised over €610,000 for the Irish Cancer Society in the last six years. In November 2018, BT Ireland was awarded the Business Working Responsibly Mark, the official standard of excellence for sustainability and corporate social responsibility. We have also been recognised as one of Ireland's Healthiest Places to Work.

We are committed to supporting the local communities in which we live and work through education, digital inclusion, charity fundraising and volunteering.

Northern Ireland

BT is one of the largest private sector employers in the province. We are leading the way in delivering exciting new services to our customers - everything from TV to high speed fibre broadband to IT services for some of the largest organisations in the market.

Find out more at:
btireland.com and **btyoungscientist.com**

BT, Grand Canal Plaza, Upper Grand Canal Street, Dublin 4, Ireland. Tel: 1800 924 362 Email: youngscientist@bt.com
BT, Riverside Tower, 5 Lanyon Place, Belfast BT1 3BT, Northern Ireland. Tel: 0800 917 1297 Email: youngscientist@bt.com