

Tasmanian Science Talent Search 2019



**Destination Moon:
more missions, more
science, more opportunities**



Key Dates at a Glance

Friday 29 March – Saturday 30 March 2019

CONSTAT 2019 – Science Teachers Association of Tasmania Annual Conference

Wednesday 1 May 2019

Membership deadline for those wanting to take advantage of discounted TSTS entry fees

Wednesday 8 May 2019

Online Registration opens for the Themed Sections (ALL entries MUST be registered online)

Wednesday 12 June 2019

Submission deadline for the Themed Sections (entries MUST be registered AND received by this date)

Saturday 10 August to Sunday 18 August 2019

National Science Week <https://www.scienceweek.net.au/schools/>

Thursday 22 August 2019

Online registration opens for Research Investigation Section

Thursday 19 September 2019

Submission deadline for Research Investigations (entries MUST be registered AND received by this date)

Sunday 24 November 2019

Award Presentation Ceremony, University of Tasmania, Launceston

Please note:

Submission dates for the Open Engineering and Technology Sections will be confirmed on the STAT website www.stat.org.au in late March.

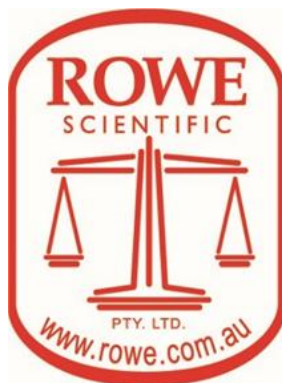
Important Changes for 2019

The successful operation of the TSTS relies on vast amounts of work by STAT Members. Except for the Director, all this work is done in a voluntary capacity. Therefore, it is necessary for STAT to identify ways to make the TSTS as efficient as possible. In 2018, the TSTS underwent a significant change when online registration was trialled. In 2019, STAT will implement additional steps:

- Increased focus on online registration and electronic submission of work (see page 4)
- Introduction of **Scientific Essay Writing** as a new Themed Section for secondary students to promote increased engagement by integrating science and literacy (see page 11)
- Increase awareness amongst teachers and students that Research Investigations and Engineering Projects entered in the UTAS Science & Engineering Investigation Awards can be resubmitted in the TSTS and that provides the pathway to National BHP Foundation Competitions (see page 12).
- Review of the Technology Challenge (details to be confirmed).
- Secondary entries in Posters, Photography Essays, Creative Writing and Essay Writing restricted to INDIVIDUAL student entries only (see pages 7–9, 11).
- Inclusion of work samples/exemplars ONLINE at www.stat.org.au/tsts (removed from this manual)

Each year, the Tasmanian Science Talent Search is generously supported by a range of national, state and local sponsors.

Their significant and ongoing support enables STAT to promote scientific literacy amongst Tasmanian students of all ages through the implementation of the Tasmanian Science Talent Search. Their financial contributions also allow STAT to provide prizes and bursaries to reward students, and teachers, for their engagement, effort and excellence in science and engineering.



What is the Tasmanian Science Talent Search?

The Tasmanian Science Talent Search (TSTS) is an initiative of the Science Teachers Association of Tasmania Inc (STAT). The TSTS is supported by an enthusiastic and committed group of sponsors. STAT's philosophy is to celebrate quality science teaching and learning in all Tasmanian Schools through the recognition of outstanding work in a variety of scientific areas.

Sections:

There are eight (8) sections in the TSTS to allow for individual students' preferred learning styles. The eight sections are sub-divided into two categories: Themed and Open.

Themed Sections:

- Posters
- Videos
- Photographic Essays
- Creative Writing
- Scientific Essay Writing (**new in 2019**)
- Technology Challenge

Open Sections:

- Engineering
- Research Investigations

Divisions:

Each section is further divided into divisions based on Year levels/Grades.

- In Primary, the divisions are: Early Childhood (K-2), Lower Primary (3-4) and Upper Primary (5-6).
- In Secondary, the division are Junior Secondary (7-8) Intermediate Secondary (9-10) and Senior Secondary (11-12).
- If entries in a division are too numerous, STAT reserves the right to judge based on Year levels. For example, Upper Primary (5-6) may be divided into separate Year 5 and Year 6 divisions.

How to register entries?

All entries **MUST** be registered online. A link will open approximately **ONE MONTH** before closing dates (see **Key Dates at a Glance**) and will be available at <http://stat.org.au/tsts>

Entry Types:

There are three types of entries:

- Individual student entry
- Small group entry (up to **three** students)
- Whole class entry (only acceptable for Early Childhood and Lower Primary Divisions)

Please note: Not all entry types are eligible for each TSTS Section (**check Section guidelines for details**).

Entry fees:

- The entry fee is **\$5.00 per project**
- STAT members receive a **60% discount** when submitting **10 or more entries**, providing invoices are paid by the due date (**\$2.00 per project for 10 or more entries**)
- To receive the STAT membership rate individuals & schools need to be financial members by **1 May 2019**. Download a 2019 membership form at <http://stat.org.au/membership>

Payment:

STAT will invoice the school for all entries submitted following the closing date. Please check that the School Business manager's details are recorded on the online entry form in the appropriate place and share the process with your School Business manager.

How to submit entries:

In 2018, the TSTS started a transition towards online registration and electronic submission to promote sustainability. In 2019, STAT's commitment to sustainability continues.

TSTS Section	Registration	Submission of Entry	Due Date
Posters*	Online only	Hardcopy, delivered	Wed 12 June
Videos	Online only	Electronic only via upload	Wed 12 June
Photographic Essays*	Online only	Hardcopy, delivered	Wed 12 June
Creative Writing	Online only	Electronic only via upload/email in PDF	Wed 12 June
Scientific Essay Writing	Online only	Electronic only via upload/email in PDF	Wed 12 June
Technology Challenge	Online only	Design/solution brought to Judging Day	TBC
Engineering	Online only	Invention brought to Judging Day	TBC
Research Investigations	Online only	Electronic only via upload/email in PDF	Thurs 19 September

*Hardcopy entries of Posters and Photographic Essays MUST be delivered flat (not rolled). They can be dropped at a collection point, delivered by courier or Australia Post.

ALL entries MUST be received at one of the collection points by the DUE DATE

Late entries cannot be accepted.

Main Collection Point:

Director – TSTS (Doug Grubert)
C/- West Launceston Primary School
24-38 Basin Road,
Launceston TAS 7250

Hobart Collection Point:

Director – TSTS (Doug Grubert)
C/- Heather Omant
St Mary's College
164 Harrington Street
Hobart TAS 7000

Judging of Entries

Entries will be judged by members of STAT. Teachers and Schools will be notified of student winners throughout the year and results will also be posted on the STAT website <http://stat.org.au/tsts/>

Becoming a Judge

Judging of the TSTS is a very large job. Each year, over 1000 entries are judged by a comparatively small number of volunteers who are STAT Members. Judging a Division, or a sub-set of a Division of the TSTS is a highly effective professional learning experience and would contribute to attainment of certain aspects of your Professional Standards. If you, or a small team of teachers from your school are interested in Judging please contact the Director, Doug Grubert to discuss opportunities Doug.Grubert@gmail.com

Presentation of prizes

Winning students, their teachers and families will be invited to the Presentation Ceremony, which will take place at the University of Tasmania, Launceston on Sunday 24 November 2019.

What recognition will your students receive for their effort?

All students receive a participation certificate which can be downloaded and printed off. Schools are encouraged to celebrate student success by presenting these certificates at an appropriate assembly or home group gathering.

What will the winners and place getters receive?

Each Division in every Section will be considered for 1st, 2nd and 3rd prize winner together with Merit Awards. These prizes will be presented at the Presentation Ceremony in November. Students who achieve at this level will be invited to the Presentation Ceremony.

Encouragement Awards

Some students will receive Encouragement Awards. These will be emailed to schools and can be printed. Encouragement Awards are for student work that did not quite reach the Merit standard but which is nonetheless worthy of recognition beyond that of participation. Encouragement Awards enable acknowledgement of effort and celebration of success at the school level.

What standard of student work is expected?

STAT expects that all work submitted to the TSTS is of a high standard. On rare occasions, where entries do not meet that standard, the judging committee reserves the right to award prizes at a lower level or to not award any prizes. For example, sometimes 1st Place is not awarded. No correspondence will be entered regarding judging.

Winning entries are on display for the public and sponsors to see and consequently, we need to be proud of our students' efforts in both scientific thinking and presentation.

How much help can your students have?

STAT encourages conversation, communication and mentoring in all entries, with the proviso that any contribution from those other than the student be acknowledged appropriately.

Often scientists will mentor older students while enthusiastic grandparents might support younger students. Students will frequently have a great idea but need support to present it in a quality way – adult and peer support to enable this to happen is encouraged and indeed mirrors what would happen in the scientific community.

Tap into your school and local community – guidance, support and discussion around an idea will support learning in all curriculum areas and help to build a quality learning experience for your students.

Tasmanian Science Talent Search 2019 – Themed Sections

Destination Moon: more missions, more science, more opportunities

Closing date for all themed sections is Wednesday 12 June 2019

There are six (6) different Themed Sections open to students from Kindergarten – Year 12:

- Posters
- Videos
- Photographic Essays
- Creative Writing
- Scientific Essays (**NEW for 2019 – secondary students ONLY**)
- Technology (details of the Technology Challenge released on the website late March)

These sections of the TSTS enable your students to explore the theme **Destination Moon: more missions, more science, more opportunities**. More information about the theme can be discovered by downloading the National Science Week support material from <https://www.scienceweek.net.au/schools/>.

As a teacher, you might develop a unit of work and give students the freedom to choose a format to express their understanding OR the decision might be to focus on one genre and support all students to take part. Some of your students might like to submit entries for different sections.

There are many opportunities to incorporate appropriate elements of the Australian Curriculum through TSTS, not just in Science, but in Mathematics, History, English, Art as well as taking into consideration the cross-curriculum priorities and general capabilities.

Read the guidelines for each Section carefully and ensure students follow them. **Entries which do not fit the criteria will not be marked.**

Once students' works are marked non-winning entries will be returned either to the school or a central point for collection by teachers. You will be notified when samples are ready for collection.

POSTERS:

AC Science:

Inquiry skills including observation & communication plus Earth and Space Sciences content descriptors for some Year levels

Understanding Goal:

Students will understand how the conventions for making a poster can be used to convey a scientific message.

Definition of a Poster for TSTS:

A poster is a visual representation advertising a scientific concept or idea in a way which will advertise this to the target audience.

Please note:

A poster for the TSTS is **NOT** a scientific chart, project, diagram or pictorial essay.

Secondary students' Posters will only be accepted from **INDIVIDUAL** students, no pairs/groups of three.

Judging Criteria:

There are three (3) criteria which will be considered by Judges in the Posters section:

1. **Scientific Concept:** relevance and significance to the theme
2. **Clarity of Scientific Message:** does the audience clearly understand what the poster is about? There should be no more than **twenty (20) words** on the poster.
3. **Presentation:** quality of the poster and adherence to the following:
 - Maximum size is **A3** (297mm x 420mm) – they **WILL** be measured
 - Must be suitable for wall display (recommended that poster is mounted on thicker card)
 - Two dimensional only – the poster needs to travel well. Collage is acceptable but there should be no protrusions that could suffer damage in transport. Make sure that any embellishment is well secured – glitter is **NOT** recommended)
 - Visual impact (the poster needs to be viewed from 3 metres).

Submission of Posters

Posters can be delivered to either of the Collection Points. Please pack and send posters flat **NOT** rolled. If sending by Courier or Australia Post please send to the **Main Collection Point in Launceston.**

CREATIVE WRITING

AC Science:

Inquiry skills including observation and communication.

Understanding Goal:

Students will understand how to use creative writing as a medium to convey a scientific message.

AC English:

Communication processes where individuals express and create written and visual texts, including those made with the aid of augmentative and alternative forms of communication. These processes share a productive approach to the creation of imaginative, informative and persuasive texts in print form. Students plan and use applied topic knowledge, vocabulary, word and visual knowledge to make considered and deliberate choices about text structure and organization to coherently express and develop ideas and communicate information in a formal or informal way. (from the AC-English document).

Genre:

Entries in the Creative Writing Section can be either **POETRY** or **PROSE**. Depending on the number of entries in any Division, these genres may be judged separately or together.

Encourage students to research the topic and use that information to support and develop their writing. The Creative Writing **should be stimulated by real scientific knowledge and/or understanding**. Where appropriate, all references and support must be acknowledged, especially for older students.

Secondary Creative Writing will only be accepted from **INDIVIDUAL** students, no pairs/groups of three.

Judging Criteria

There are three (3) criteria which will be considered by Judges in the Creative Writing section:

1. **Scientific concept:** The Creative Writing addresses a significant and relevant aspect of the theme whether in a past, present or realistic future context.
2. **Creativity:** The Creative Writing uses ideas, words and literary expression creatively to convey the message. Students may use small illustrations to add extra impact.
3. **Adherence to Presentation Guidelines**
 - All Creative Writing **must** be submitted electronically as PDF upload or submitted via email
 - Grammar, spelling and punctuation are accurate
 - The Creative Writing is no more than a single-sided A4 page (any references/acknowledgment of support can be included on the reverse side).
 - Text size is a **minimum** of 12 point, in a clear font
 - The page has a **minimum** 1cm margin on all sides
 - The student's name, school and division (year level) is included.

Please Note:

STAT recognises that for some students, schools and particularly younger divisions, it might be preferable for students to handwrite their work neatly and include hand-drawn illustrations. This is perfectly acceptable in this Section. Student work can then be scanned as a colour PDF using your multifunction printer/coper/scanner and submitted. Plus you can retain the original for your own assessment purposes.

PHOTOGRAPHIC ESSAYS

AC Science:

Opportunities for Inquiry skills of Observation and Communication as well as Science Understanding and Science as a Human Endeavour.

Understanding Goal:

Students will understand how the conventions for making a photographic essay can be used to convey a scientific message.

AC English:

Opportunities to support the communication process, particularly in the areas of writing, creating, reading and viewing.

What is a PHOTOGRAPHIC ESSAY?

This genre is a set of 6 – 8 photographs, **taken by the entrant**, which combine to express a scientific concept and the creator's thoughts about the 2019 theme. It is an interesting way of observing, recording and studying phenomena which might go unnoticed by the casual observer.

Each photograph should include a short caption of up to twelve (12) words to help provide context.

Each entry should be accompanied by a context statement of the photographer's thoughts – a short description to support the display – this should be attached to the back of the work to be viewed by judges only. The **major communication should be through the photographs and the captions** which are viewed from the front of the work.

Secondary Photographic Essays will only be accepted from **INDIVIDUAL** students, no pairs/groups of three.

Judging Criteria:

There are three (3) criteria which will be considered by Judges in the Photographic Essay section:

1. Scientific Concept:

- How relevant are the individual photographs to the theme?
- Is a science concept clearly conveyed through the images?
- Does the sequence of photographs tell a story?
- Does the written description/context statement support the visual story?

2. Creativity and Technical Skill

- Overall visual impact of the presentation (quality and clarity of images)
- Photographs are presented in a logical sequence

3. Adherence to Presentation Guidelines

- Photographs are best printed on **glossy paper**
- Entries should be mounted either on a poster (maximum A2) or an A4 concertina fold display (four sides – equivalent to A2)
- The title and photo captions should be neat, relevant and clear

Submission of Photographic Essays:

Photographic Essays can be delivered to either of the Collection Points. Please pack and send them flat **NOT rolled**. If sending by Courier or Australia Post please send to the **Main Collection Point in Launceston**.

SCIENTIFIC VIDEOS

AC Science:

Science as a Human Endeavour, Science Inquiry Skills

AC Digital Technology:

Digital Technologies Processes and Production Skills

AC General Capabilities:

Information and Communication Technology (ICT) Capability

What is a SCIENTIFIC VIDEO?

A scientific video lets students engage in a rich, cross-curriculum learning opportunity. Entrants must research a scientist, scientific discovery, programme or technology that relates to the theme. They must then plan, create and publish a video to communicate a scientific message to an identified target audience.

Judging Criteria:

There are three (3) criteria which will be considered by Judges in the Scientific Video section:

1. Scientific Concept:

- The Video explores a concept that relates to a relevant and significant aspect of the theme whether it be a past, present or emerging science and technology.

2. Creativity and Technical Skill:

- Overall production quality of the video
- Originality, creativity and flair

3. Adherence to Presentation Guidelines

- Entries must be original videos of up to 3-minutes duration
- Videos should have 5 seconds of black screen **before and after** the main content. Therefore, the total maximum video duration is 3:10
- Acknowledgements of all references used, and help received, should be included as credits in the video production (included in the 3:00 limit).

Submission of Scientific Videos:

Files should be produced in a recognised format, uploaded to a video hosting site (Youtube, Vimeo, Dropbox etc) and a link (and possibly password) supplied for Judging purposes.

Check that links work before submission, files which do not play cannot be judged.

SCIENTIFIC ESSAY WRITING

This Section is **NEW** in 2019. It is for **INDIVIDUAL** entries from secondary school students.
The aim is to encourage teachers to integrate science concepts into their literacy framework.

AC Science:

Science as a Human Endeavour, Science Inquiry Skills

Understanding Goal:

Students will understand how to use formal essay-writing structures to construct a persuasive argument about a scientific concept.

AC English:

Students plan and use applied topic knowledge, vocabulary, word and visual knowledge to make considered and deliberate choices about text structure and organization to coherently express and develop ideas and communicate information in a formal or informal way. (from the AC-English document).

What is a SCIENTIFIC ESSAY?

A scientific essay is a research-based, referenced piece of persuasive text which examines the contribution of: a scientist, team of scientists, scientific discovery, science programme or technology that is related to the theme, whether it be a past, present or future.

Judging Criteria:

There are three (3) criteria which will be considered by Judges in the Scientific Essay Writing section:

1. Scientific Concept

- The Essay identifies a concept that relates to a relevant and significant aspect of the theme whether it be a past, present or emerging science or technology.

2. Analytical Skill

- The student presents a cogent argument for the importance of the selected topic.
- The work uses evidence to support the argument.

3. Adherence to Presentation Guidelines

- All Essays **must** be submitted electronically as PDF upload or submitted via email
- Grammar, spelling and punctuation are accurate
- Text size is a **minimum** of 12 point, in a clear font, with 1.5 line spacing
- The page has a **minimum** 2.5 cm margin on all sides
- The student's full name, school and division must be included.
- Use of in-text references and inclusion of a bibliography/reference list.
- Word limits: Junior Secondary 1200 words; Intermediate Secondary 1500 words; Senior Secondary 2000 words. All word limits **EXCLUDE** the bibliography/reference lists.

Submission of Scientific Essays

All Scientific Essays must be submitted via upload (via Dropbox or similar) or emailed as PDF files.

Tasmanian Science Talent Search 2019 – Open Sections

The TSTS has two Open Sections:

- Engineering Challenge
- Research Investigations

In these two sections, student work **does not** need to relate to the 2019 theme. Topics are unrestricted meaning students may investigate a topic of their choice. All ideas will be accepted providing they meet ethical and safety standards.

TSTS – Part of a Pathway to Excellence for Tasmanian Students

Unbeknownst to many people, Tasmanian students routinely excel on the national stage in the **BHP Billiton Foundation Science and Engineering Awards**. Statistically, Tasmania has been the most successful state/territory when it comes to having national finalists, outstripping all other regions on a per capita basis. On several occasions in recent years, Tasmanian students have travelled to the USA to represent Australia at the ISAF INTEL Science Fair.

Tasmania's success does not come by accident, rather it is created by a combination of the:

- calibre of Tasmanian students
- sophistication of the questions those students investigate/inventions they create
- high quality, ongoing mentorship by outstanding Tasmanian teachers
- opportunity to engage in a pathway that promotes excellence in science/engineering

A Pathway to Excellence is something STAT is keen to promote so that Tasmanian students continue to represent our state with distinction. The following provides Principals, Science Coordinators and Teachers with an understanding of the framework that is available

Opportunities for Tasmanian Science Students: Pathway to Excellence

Year Level	Type of Entry/Inquiry	Ways to Engage in the Pathway to Excellence
K-2:	Generally whole class, Small group/individual also encouraged	TSTS Research Investigations
3-4:	Generally small group, Whole class/individual also encouraged	TSTS Research Investigations
5-6:	Small group or Individual	TSTS Research Investigations TSTS Open Engineering UTAS Science and Engineering Investigation Awards Exceptional work entered in the TSTS is nominated for the BHP Billiton Foundation Science and Engineering Awards Senior secondary school winners/finalists from the national BHP Billiton Foundation Science and Engineering Awards can be invited to represent Australia at the Intel International Science and Engineering Fair (ISEF)
7-8:	Small group or Individual	
9-12:	Small group or Individual In years 9-12, individual entries are judged more highly than small group	

ENGINEERING CHALLENGE

Eligible students – this challenge is open to students from Year 5 to Year 12.

AC Science

Science Understanding – Physical Sciences, Science Inquiry Skills and Science as Human Endeavour

AC English & ICT

Investigation and analysis of information and evaluation of design ideas. Students will develop design ideas; generate plans and diagrams to communicate their design ideas and produce a physical solution to an articulated problem.

Challenge

Students must design, create, test and, where possible, refine a working invention. In addition to the working invention, student/s must submit:

- a 1000-word report about the development, operation and implications of the invention and
- a video presentation demonstrating the invention in action (USB or via upload)

Judging Criteria

There are three (3) criteria which will be considered by Judges in the Open Engineering section:

1. Design Approach
 - The student/s followed a design process and can provide evidence via a logbook/journal.
 - The student/s's invention should not be static unless it is an entirely new invention
2. Design Ingenuity
 - The invention needs to be a physical device that either:
 - (a) solves a problem in a scientific or engineering context; or
 - (b) provides an innovative approach to solving a problem
3. Design Value
 - The invention has the potential to make an impact, whether current or in the future.

Further Information for Students and Teachers

Regional judging will take place (date and place to be confirmed) but this is a state-wide competition. Winners will be **INVITED** to progress to the **National BHP Billiton Foundation Science and Engineering Awards**, if winning entries meet the national standard. Students and teachers are encouraged to familiarise themselves with the standard of National Award recipients by visiting <http://www.scienceawards.org.au/>.

Places to get support in Engineering

Make good use of the resources in your community and your schools. Teachers of MDT & Agriculture will often have good ideas and talented students who might well benefit from this opportunity. Students successful in Engineering may not always be your best science students.

If you have parents working in an aspect of Engineering then invite them to talk to your students about their work and the way they approach a problem. There are no limitations to the options for projects and students can work together to find a solution. The challenges are open so it can be a problem which interests the student or something to meet a human need or anything in between – the opportunities for ideas are endless and the reward can be quite significant.

RESEARCH INVESTIGATIONS

Eligible Students

The Research Investigation Section is open to all students from Kinder to Year 12.

AC Science

Science Understanding (strand dependent on topic), Science as Human Endeavour & Science Inquiry Skills

Topic

Students may choose any topic for research.

Closing date

Thursday 19 September. See page 4 for submission details. Students and teachers are encouraged to familiarise enter the same work in BOTH the **Tasmanian Science Talent Search Research Investigations** AND the **UTAS Science and Engineering Investigation Awards**.

Students are to plan, conduct and report on an experimental inquiry on a topic of their own choice.

- Kindergarten to Year 4 students may have a **whole class entry**.
- Individual and small group entries are also acceptable from K-4.
- Year 5 – 12 students may enter in a small group (no more than 3 students) or individually
- Individual entries from students in years 9 to 12 are considered more highly.

Judging Criteria

Judging will be based on evidence of working scientifically and will include:

- Scientific significance of the topic
- Using Science, planning and conducting inquiries
- Processing data
- Evaluating findings
- Acting responsibly: No explosives, illegal substances or animal cruelty is acceptable
- Evidence of Risk Assessment
- Inclusion of acknowledgment of mentors and supporters (entries must have academic integrity).

PLEASE NOTE:

All entries are judged initially on merit alone. In addition, any which fit the criteria of the Sponsor Topics are judged for those prizes.

Winning entries from years 5 – 12, which reach the national standard, will be invited to enter the national **BHP Billiton Foundation Science and Engineering Awards**

NEED HELP GETTING STARTED?

- The Science Teachers Association of NSW has examples of student research at http://www.youngscientist.com.au/?page_id=1885 . Make sure any ideas or information is acknowledged. (Thanks to STANSW for the support).
- The **CREST Awards Scheme** run by BHP has lists of past projects to help stimulate ideas. <https://www.csiro.au/en/Education/Programs/CREST/About-CREST>
- Visit the **UTAS Science and Engineering Investigation Awards** page <http://www.utas.edu.au/science-engineering-investigation-awards>
- Contact STAT or visit www.stat.org.au/tsts
- Try asking family, community members or local business/industry representatives if they have a topic worthy of investigation.