

72<sup>ND</sup>



SCIENCE TALENT SEARCH



HANDBOOK  
2023

**INNOVATIONS:  
POWERING FUTURE  
INDUSTRIES**

# SCIENCE TALENT SEARCH COMMITTEE 2022

The STS Committee consists of volunteer members of the Science Teachers' Association of Victoria Inc. and other interested persons who volunteer their time and expertise to organise the judging and exhibition of entries. In 2022 the STS committee consisted of:

## STS Management

Josie Crisara	Aitken College
Leonie Lang	Science Educator
Janice Teng	Science Teachers' Association of Victoria
Lucy Cassar	Thomas Carr College
Alexandra Abela	Penleigh and Essendon Grammar School
Liz Billings	Science Teachers' Association of Victoria

## STS Committee 2022

Dilan Abeyaratne	Brunswick Secondary College
Jamie Astill	Sirius College
Anna Barnes	Loyola College
Catherine Bellair	Thomas Carr College
Jennifer Cutri	Australian International School – Hong Kong
Lynden Fielding	Preshil – The Margaret Lyttle Memorial School
Maureen Frith	Science Educator
Sandeep Gurm	Science Educator
Rebecca Hann	Berwick College
Marisa Jarvis	Hume Anglican Grammar
Damiano Lo Nigro	Baden Powell College
Veena Nair	Viewbank College
Raquella Neiger	Science Educator
Geraldine Nicholas	Parade College
Pina Pikos	Hume Anglican Grammar
Ann Pisarevsky	Science Educator
Sarah Shatford	Hume Anglican Grammar
Jason Smith	Parade College
Amelia Strezbonski	Science Educator
Timothy Symons	St Oliver Plunkett Primary School
Rosina Tassone	Kolbe Catholic College
Kylee Townsend	Hazel Glen College
Gayatri Vazirani	Blackburn High School
Brittany Vining	Science Educator
Janice Youl	Science Educator

## STS Assistants

David Trotter	Science Educator and STS Database
Anne Heard	STAV Receptionist
Collette Whittaker	STAV Administration Officer
Anna Bejanoff	STAV Administration Officer
Kellie Jackson	STAV Desktop Publishing
Kushla Ross	Studio Cahoots
Sue Elliott	STAV Accounts
Erandi DeSilva	STAV Accounts
Terrie Said	STAV Events
Annie Stevens	Accountant for STAV and Science Victoria

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The Committee reserves the right to retain selected entries after Exhibition and Presentation Day and to use such entries for public display to further the aims of STS.

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A copy of the 2023 STS Handbook is distributed to all STAV members and Subscriber Schools.

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To purchase a hard copy of the STS Handbook please contact the STS Officer:

Email: [sts@stav.vic.edu.au](mailto:sts@stav.vic.edu.au)

Phone: (03) 9385 3999

Cost: \$15.00 (includes postage & handling)

Edited by: Janice Teng, STS Officer.

# ABOUT THE SCIENCE TALENT SEARCH

The Science Talent Search (STS) is a familiar concept to primary and secondary science teachers in Victoria.

STS was founded in 1952, making it one of the longest running programs of its type in the world!

## STS has three broad aims:

1. To stimulate an ongoing interest in the study of sciences by:
  - encouraging independent self-motivated project work amongst students of science;
  - giving students the opportunity to communicate their achievements to a wider audience;
  - according recognition of effort and achievement in a scientific enterprise.
2. To promote the direct involvement of the students in the processes of science and its communication.
3. To give the public at large an opportunity to see the quality of work being achieved in science, by both primary and post primary students.

## Why STS?

We believe that science teachers have a professional responsibility to encourage students to develop a broader understanding and application of science and technology which is fundamental to sound social and personal judgement, now and in the future.

Science Talent Search is for everybody: for those planning a career in one of the sciences or technological disciplines, for those interested in scientific hobbies, or for those concerned enough to present a point of view about science through the medium of poster, essay, video, photography, games or computer programs.

The substantial participation in STS indicates that a significant number of teachers are making provision for students of widely differing interests and abilities to pursue scientific activities of interest to them.

We believe that personal expression of interest and concern through independently executed, open project work is an essential ingredient in the appreciation and understanding of science.

We believe that through STS we are developing in students, skills and attitudes which will contribute to the well being and development of the wider community in which they will live and work.

The Science Talent Search would like to acknowledge and pay respect to the First Nation peoples and custodians of the land and waters encompassing on which we are each located. We recognise and celebrate their ongoing connection to culture and Country. We respectfully acknowledge all Elders past, present and emerging as we continue to walk together toward a connected Country.

## ENTRY INFORMATION

### Entry fees

Individual	\$9.00 per entry (inc GST)
Group (maximum 2 students)	\$17.00 per entry (inc GST)
Class Project (Primary divisions only)	\$30.00 per entry (inc GST)

### Divisions

Divisions	Code	Year Level
Lower Primary	L	Foundation to Year 2
Middle Primary	M	Year 3 & 4
Upper Primary	P	Years 5 & 6
Junior	J	Years 7 & 8
Intermediate	I	Years 9 & 10
Open	O	Years 11 & 12

### Sections

Sections	Code
Experimental Research	R
Creative Writing	W
Working Models	M
Inventions	I
Games	G
Computer Programs	C
Posters – Scientific Wallcharts	P
Science Photography	F
Video Productions	V
Class Project (Primary divisions only)	S

Please note that the entrant's ID code is unique and not transferable.

Names cannot be substituted once the online registration closes.

Each school that enters STS **MUST** appoint an STS School Coordinator.

This person then becomes the contact person for all STS correspondence and is responsible for the following:

## February to May

Publicise the STS competition in their school and ensure students and parents are given the relevant information concerning the appropriate sections.

## February to October

Answer questions from staff and students about the STS competition.

## March to May

Enter correctly and fully, all entry details on the STS online database by the due date.

Before you enter students please check that students and their teachers are aware of specific guidelines for the section they wish to enter.

Students will be disadvantaged if they don't follow all of the guidelines in this Handbook.

Ensure you have attended to the following:

- Read the STS School Coordinators' Role Description & General Information (page 3-5).
- Included Volunteer Judges details.
- Checked spelling of student names.
- The maximum number of entries is equal to 5% of your student enrolment at each campus OR 25 entries (whichever is the greater).
- There is a maximum number of 8 class project entries per school.
- Students are made aware of the current guidelines for the Sections they have entered, including presentation requirements.
- Students have been told to keep a copy of their entry (recommended as STS takes no responsibility for lost entries).
- Enter judges details online.

## May

- Check Entry Data. Registration data from the school portal.

## June

- Distribute Schools Pack 1 (Official face sheets for student projects from the school portal).

## July

- Arrange payment of entry fees. Your school will be invoiced for all on-line registration of entries.
- You will need to collect and **submit** electronic copies from students and upload using the school portal. Oral presentation videos are recommended to be uploaded to an online platform such as Google Drive, vimeo and You Tube with a link provided in the report.
- Ensure that the students do not individually send their entries to STAV.

## August

- Make sure students are aware of venues and times for the Special Judging Day.
- For sections which have a Judging Day, remind students to bring projects to the venue. All metropolitan students in applicable sections **must** attend Judging Day.
- Ensure Judges from your school are aware of their judging commitments. Judges from Country and Jewish Schools will receive first preference for online judging.
- Due to the organisation and distribution of judges over the entire competition, **judges are still required even if some or all of your entries are subsequently not submitted**. Please be aware that some sections require a higher judge to entry ratio and without our volunteer judges this competition would not be able to continue.

## August/September

- Check Schools Pack 2 (Last chance to update project details with STS).

## October/November

- Receive and distribute Schools Pack 3 (Bursary Results and Presentation day details).
- Ensure that all registration details are followed precisely for Exhibition and Presentation Day.
- Organise Exhibition & Presentation Day attendance for bursary winners.

A commitment by students to the Science Talent Search also involves a commitment by teachers from your school.

# GENERAL INFORMATION

## FOR SCHOOL STS COORDINATORS AND TEACHERS

### 1. Maximum Number of Entries per School Campus: Primary Campus (F-6) or Secondary Campus (7-12)

- Enrolment numbers in a Primary campus include all students enrolled from F-6, while enrolment numbers in a Secondary campus include students in Years 7-12 only.
- Each school campus (ie. F-6 or 7-12) is restricted to a maximum number of entries equal to 5% of the student enrolment at that campus OR 25 entries, whichever is the greater.
- There is a maximum of 8 entries per school for the Class Project. A class project can have up to 35 students per project.
- For STS purposes a campus is a separate location with students permanently enrolled at that location and administered by a campus Principal.
- Primary and Secondary components at the one location are regarded as separate campuses. Separate Entry details must be completed for primary and secondary.

### 2. Open Division (Year 11 and 12)

- STS aims to encourage students to pursue their interests in science by allowing keen students who have personal interests in one of the Sections offered, the opportunity to develop these interests provided they fit into the guidelines of the competition.
- We hope teachers will encourage only those students who are capable of organising their time to fulfil VCE requirements and complete work on personal projects.

### 3. Individual and group entries

- Students can enter an individual project or a group project.
- A **group** consists of **TWO** students only, with the exception of the Class Experimental Research Project.
- The Class Experimental Research Project can have up to 35 students per project.

### 4. Schools' responsibilities for judging entries

All schools entering STS must provide one Judge per twelve entries (or part thereof). Therefore, even if your school has only one entry, you must still supply one judge. You must nominate judges when registering entries.

All Judges from the metropolitan area will be required to select a Section which will be judged at one of two venues on Special Judging Day. You may, however, choose online judging sections as your **second** preference.

Teachers who cannot judge on Saturdays due to religious reasons can select online judging. Please email [sts@stav.vic.edu.au](mailto:sts@stav.vic.edu.au) if you encounter any issues.

Judging on the Special Judging Day requires a commitment of about 4-5 hours – from 8:00am-1:00pm.

Judging on the Special Judging Day is usually in pairs. Where possible a primary and secondary judge will be paired together. Judges are expected to evaluate all divisions within a section.

1. Country Judges will receive first preference for online judging.
2. If a judge becomes unavailable at the required judging time, it is the school's responsibility to provide replacement judges for those who cannot fulfil their obligation.



## 5. How to enter your students

First, register your school to **ACTIVATE** your account for the current year using the online school portal.

The STS school portal will become live on 27 February 2023 at 9.00am. Registration function will be deactivated on Sunday 28 May.

### To get started:

1. Have the following information ready before you start:
  - a. School STS coordinator details (including correct email address)
  - b. School campus (F-6 or 7-12) enrolment number.
  - c. School account contact details.
  - d. List of volunteer judges (1 judge per 12 entries or part thereof), their three preferences for judging sections and VIT/WWCC details.
  - e. Full STS student entry details.  
[Download student and judge proformas from the Science Talent Search website to help collect full details.]
2. Go to the STS portal:  
[www.stav.vic.edu.au/sts/login](http://www.stav.vic.edu.au/sts/login)
3. Click on the **“Register here”** link
4. Use the search function to locate your school (check that the campus is correct). Primary and secondary must register as separate campuses.
5. If your school isn't on the list, contact STAV by email: [sts@stav.vic.edu.au](mailto:sts@stav.vic.edu.au) .
6. Enter STS coordinator email address. Ensure you enter the address precisely.
7. Enter a password of your choosing and Log in. Record your password somewhere for future reference.
8. Press **“Login”** and the program will generate an email message that activates your account.

### Once you receive your confirmation email:

9. Enter your email address and your password to access and edit the records for your school.
10. Check and update your school details. Choose the **“Update School Details”** link. Ensure you click on the **“Update Details”** button once your changes have been made.
11. Enter details for your **First judge**, *then* enter project details. After 12 projects have been entered you will need to add another judge before registering more projects. Please check spelling carefully and ensure you enter **all** details requested. Once registration closes you will not be able to make changes yourself.
12. Ensure you press both the **“Add Student”** button and the **“Submit”** button or your information **won't be saved**.
13. Entry summary is available for download via the school portal.
14. You can add, edit or remove entries at any time from this point **until the closing date Sunday 28 May**.

For more detailed instructions visit the STS website.

## 6. Payment

Your school will be invoiced via your Accounts details entered for the **number of entries in the online database on the closing date**. Entry fees will need to be paid from this data as the administration of the entries will have already occurred from this point on.

## 7. Submission of entries

- All entries must be submitted electronically.
- Students attending **Judging Day** are required to bring a physical copy with them on the day.

STS Website: [stav.org.au/science-talent-search/](http://stav.org.au/science-talent-search/)



# DATES AND VENUES

## Important Dates

Date	Details
Monday 27 February	Online Schools Portal – Entry Registration opens
Sunday 28 May	Entry Registration closes
Monday 5 June	<b>Schools Pack 1:</b> Official registration documents via email and the school portal
Friday 16 June	<b>School portal:</b> Electronic submission of entries activated
Sunday 23 July	<b>School portal:</b> Electronic submission of entries closes

### LATE ENTRIES WILL NOT BE ACCEPTED

2 Weeks	29 July – 13 August	Judging of online sections
Saturday	5 August	Judging Day
Monday	14 August	Schools Pack 2: Entries received Via email and the school portal
Monday	2 October	Schools Pack 3: Results and Certificates
TBC		Exhibition and Presentation Day

## Judging Day: Saturday 5 August

You must bring your project with you to Judging Day.

### Venues

<b>Methodist Ladies' College</b> Fitzwilliams Street Entrance, KEW	<b>Sections:</b> <ul style="list-style-type: none"> <li>• Posters – Scientific Wallcharts</li> <li>• Computer Programs</li> <li>• Class Projects</li> </ul>	<b>Times for judging are:</b> <b>9.00am – 10.30am</b> Lower, Middle and Upper Primary <b>10.00am – 12.30pm</b> Junior, Intermediate and Open	Students are required to discuss their entry with STS Judges.  Computer entrants must bring their own laptop or device.
<b>Parade College (TBC)</b> 1436 Plenty Road, BUNDOORA	<b>Sections:</b> <ul style="list-style-type: none"> <li>• Video Productions</li> <li>• Science Photography</li> <li>• Working Models</li> <li>• Inventions</li> </ul>	<b>Times for judging are:</b> <b>9.00am – 10.30am</b> Lower, Middle and Upper Primary <b>10.00am – 12.30pm</b> Junior, Intermediate and Open	Students are required to discuss their entry with STS Judges.  Video entrants must bring their own laptop or device for their presentation.

## Exhibition and Presentation Day: Venue and Date TBC



# AN INVITATION TO ALL STUDENTS IN VICTORIA TO ENTER THE 72ND ANNUAL SCIENCE TALENT SEARCH



The Science Teachers Association of Victoria Inc. invites all students to enter this year's Science Talent Search. You may enter as an individual or as part of a group of two (2). You may enter into one or more of the Sections described in this book. Please check this Handbook for the Section guidelines, as entries which do not fulfil these guidelines will be disadvantaged.

## How to enter

### 1. Entry details

- a. Obtain an STS student entry proforma from your science teacher or from the STAV website.
- b. Return the completed form ONLY to your Science Teacher.
- c. Your school STS Coordinator will enter the data online.  
Your school STS coordinator will receive acknowledgement of your entry from STAV including:  
Official STS Face Sheets and general information.

### 2. Entry fees

- a. For entry fees, see page 2 for more details.
- b. Check with your school STS coordinator for payment method.

### 3. Submission of entries

- a. **ALL entries** must be submitted **electronically** by your teacher.  
Please check each section for specific project requirements for electronic submission.

- b. **ALL students** must provide a **signed Entry Face Sheet** to be submitted electronically by your teacher.

- c. Students attending **Judging Day**. Please bring your project along with all electronically submitted reports for ease of judging. Ensure your signed Entry Face Sheet is with you for registration on the day.

Entry Face Sheets should be attached to:

- \* the cover of your report folder, OR
- \* back of your Poster project

**No responsibility is taken for lost or damaged equipment.  
Please ensure you keep your property secure.  
\* Judges decisions are final. No correspondence will be entered into.\***

Keep an electronic copy of your project to be submitted online.

# **AWARDS** ALL STUDENTS WHO ENTER THE SCIENCE TALENT SEARCH ARE ELIGIBLE FOR AWARDS. SCHOOLS ALSO BECOME ELIGIBLE FOR SPECIAL AWARDS.

## **Student Awards**

### **a. Bursaries**

Every year individuals and groups are awarded bursaries totalling tens of thousands of dollars, thanks to the generous sponsors of STS. Major and Minor bursaries are awarded in all Sections.

As a gift for attending the Presentation Day ceremonies, special medallions are also presented to Bursary winners. Bursary winners who do not attend their Presentation Ceremony WILL NOT receive a medallion.

Bursary awards are made out to individual entrants. In the case of a group award, the value will be halved and made out to each member of the group.

### **b. Certificates**

A Bursary certificate is printed for each student gaining a Major or Minor award, for an outstanding and exceptional project.

A Distinction Certificate is issued to entrants whose projects met all of the criteria and were of a very high standard and quality that deserves special commendation.

A Merit Certificate is issued to entrants whose projects were of good to very good standard and deserve recognition for their work.

Those entrants who don't receive a prize-winning Bursary, Distinction or a Merit Certificate, receive a Certificate of Acknowledgement.

## **School Awards**

Schools with a very high standard of entries across all the sections are nominated by the STS Management for special awards.

### **The Peter Craig School Awards 2022**

- Glendal Primary School
- Holy Rosary School
- Blackburn High School
- Fintona Girls' School – Senior Secondary

### **The Hugh McKnight Encouragement Awards 2022**

- Beverley Hills Primary School
- St Leonard's College – Primary
- Viewbank College
- Presbyterian Ladies' College – Senior School

## **ATTENTION TEACHERS!**

**Thinking of introducing Science Talent Search in your school?**

**Is this your first time entering or coordinating STS?**

**Don't know where to start?**

Order a free copy of our STS professional development kit, consisting of an information booklet and accompanying resources. The kit provides general information about the competition's sections and divisions, your responsibilities, hints on how to implement the competition successfully.

Contact the STAV office for an electronic copy.



## **Discover how STS integrates with Victorian Curriculum**

Science Talent Search fits ideally into the Victorian Curriculum philosophy of teaching and learning. STS encourages creative, self-motivated project work through open-ended multi-disciplinary projects. The competition requirements integrate well with many of the Victorian Curriculum strands and substrands; and they closely align with many of the achievement standards for science and other learning areas and capabilities.

**For more information about using Science Talent Search as an integral part of your Victorian Curriculum implementation, contact the Science Talent Search office on 9385 3999 or go to: [stav.org.au/science-talent-search](http://stav.org.au/science-talent-search)**

## a. For teachers

### A few ideas on how to get classes going

- Run your own science competition to stimulate interest (complete before the end of Term 1).
- Contact STS Coordinators at other schools to see how they organise their students.
- Set a project as part of your Science program in primary, junior, and intermediate classes.
- Look at projects from previous years. (eg. from students previous work in STS)
- Put some questions to the class to discuss how to structure a project.
- In class, suggest things like “This task would make a good basis for an STS project.”
- When demonstrating a technique, say “You could use that to look at .....and that would make an interesting STS project.”
- When a class is investigating a phenomenon, suggest that anomalies be followed up.
- Declare your availability to assist students.
- Outline criteria and guidelines as specified in the Section Information (photocopy for students).
- Attend sessions on STS which are part of some STAV conferences.

If you need support or have suggestions you can contact the STAV office.

## b. Professional development kit

Order a free copy of our STS professional development kit, consisting of an information booklet and accompanying resources. The kit provides general information about the competition’s sections and divisions, your responsibilities, hints on how to implement the competition successfully.

Contact the STAV office for an electronic copy.

## c. For students

- The best thing to investigate or produce is something that strikes you as worthwhile – perhaps something that you have seen or heard which you would like to have a closer look at or tell others about. You may find something interesting in your science classes, around the house or outside. Talk to others about your ideas.
- Website link below has some suggested sources of ideas. If you borrow an idea, try to introduce some original slant to it. But remember, your own ideas are best.
- You may need help with some presentation skills in your project – make sure you acknowledge them – but the content and ideas of your STS project must be yours. For example, if you are Lower Primary you may choose to ask someone to type your work for you; this typing should be word for word from either your own handwriting or your verbal description and must be acknowledged as such in your ‘Acknowledgements’ section.

## d. Project references and resources

Visit [stav.org.au/science-talent-search](http://stav.org.au/science-talent-search) for links to relevant websites.

Links to the external websites do not constitute an endorsement or a recommendation of any material on those sites or of any third party from those sites.



### Indigenous perspective resources

In order to bring indigenous perspectives to our theme, we may include several links on our website for the purpose of disseminating information. However, STS does not guarantee, and accepts no legal liability arising from or connected to, the accuracy, reliability, currency or completeness of any material contained on any of these sites. Note: some of the links due to the time of publication may use outdated terminology in reference to First Nation Indigenous Australians.

# EXPERIMENTAL RESEARCH

## LOWER, MIDDLE AND UPPER PRIMARY DIVISIONS

### Experimental research involves:

1. Choosing a topic. Describing the details of the chosen topic. Pick a topic that interests you, it does not have to be based on this year's theme.
2. Asking questions about your topic. Why? What if...? How? It would be a good idea to do some reading about your selected topic. Libraries and the internet are very useful resources. You could also discuss ideas with others familiar with your topic.
3. Forming an hypothesis. This is an educated "guess" as to what you think will happen in a certain set of circumstances or conditions. (If you make one change how does it affect another).
4. Investigating your hypothesis. To do this properly you will need to design and carry out experiments in a safe manner.
  - Data logging equipment can be used to collect data.
  - Repeat the experiment a number of times to reduce random errors.
  - Use experimental controls eg. variables, to make results more meaningful.
5. Carefully record the results of the experiments. A survey, if it is used to collect data as part of an investigation, is regarded by STS as an experiment. (Keeping a log book or taking photographs are useful ways of recording).
6. Analysing results. What do your results mean?
7. Being prepared to change your original ideas and procedures as you get results which may be unexpected.
8. Working logically through your results to support or reject your hypothesis.
9. Writing a report to tell others what you did and what you found, based on experiments you carried out. The experimental report is NOT a library or online research assignment.
10. Your experimental investigation must be presented as a scientific research report.

### Writing an experimental research report

✓ Tick that you have satisfied each of the guidelines and criteria below.

#### Entry guidelines

Your report format may be written in passive or active voice but must include the following:

- Introduction** – What gave you the idea? How did you get started? Provide some background information on the topic.
- Aim** – What you are trying to find out?
- Hypothesis** – A scientific guess on what you think will happen based on your initial understanding of your idea
- Materials** – List everything used!
- Method** – List everything you did, but remember to keep them in order (like a recipe).
- Describe the **safety requirements** you followed in conducting this experiment. Attach **Risk Assessment Form**, sample provided on page 24.
- Results** – Everything you discovered (or found out). Keep a little book (logbook) and record everything as you go. To show all this use graphs, tables, pie charts, photos etc...
- Discussion** – Judges pay particular attention to the quality of your discussion. Consider using the following questions as prompts. (Discussion should not be question/answer style)
  - What happened and what did you learn?
  - Did it reflect your hypothesis? Do you think you know why?
  - Did you find any unexpected results? Can you explain this?
  - What problems did you encounter?
  - How could you improve on your experiment or data collection?
- Conclusion** – This is a simple paragraph that links back to your aim and hypothesis. Did you find out what you wanted? Was your hypothesis right?
- Acknowledgements and References**– Make sure you include a list of people who gave you help/advice and outline the ways they helped you.
- List any books or websites you used. (See page 24 to reference correctly)
- When your report is finished ask your teacher or parent(s) to check your report to make sure it follows the guidelines.
- Keep a full electronic copy of your work**, including scans of log book etc. See page 24 for naming your file.



#### Entries must be electronically submitted

Project files should be given to your teacher at least a week before the due date.  
Online submission portal closes: 23 July 2023

All guidelines should be followed to avoid being disadvantaged during judging.

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### Experimental research involves:

1. Choosing and defining a topic. Pick a topic that interests you, preferably one which will give you the opportunity to learn something you did not already know. Don't forget to use skills you already have!
2. Asking questions about your topic.
  - What if...?
  - What can I investigate in this topic that is useful to the world and perhaps solves a problem(s) or makes life better or easier?
  - What is this investigation going to achieve?
3. Search out what has been done previously (libraries, internet) in this area to become familiar with this topic and ensure you don't repeat existing work. Maybe discuss ideas with others familiar with your topic. **NEW, ORIGINAL, and USEFUL IDEAS** are paramount!
4. For projects based on standard experiments, please note that these are generally not original and have been previously investigated. However, you could apply them in a **NEW** way to solve a problem or benefit the community. Make some changes, or repeat the experiment a few times under different conditions to make it a new investigation with outcomes to potentially benefit the world. Remember that Science continuously builds on previous research and discoveries.
5. Students interested in a psychology-based investigation should ensure that they have met ethical requirements and follow scientific rigour.
6. Any investigations, especially one that solves a problem, with the aim of making life better or easier for the community, in an **ORIGINAL** way and for a **USEFUL** purpose that has not been previously investigated, are likely to be more highly regarded by judges.
7. Forming an hypothesis: what you think will happen in a certain set of circumstances/conditions. Make it specific, so that at the end, you can clearly say supported or rejected.
8. Investigating your hypothesis. To do this properly you need to design and carry out experiments in a safe manner.
  - The method should be logical and test the hypothesis.
  - Allow sufficient time to get meaningful results
  - Repeat the experiment several times to reduce random errors.
  - Use Experimental Controls to make results meaningful.
9. Carefully recording the results of the experiments. A survey, if it is used to collect data as part of an investigation, is regarded by STS as an experiment. (Keeping a log book or taking photographs are useful ways of recording).
10. Analysing results. What do your results mean?
11. Being prepared to change your original ideas and procedures as you get unexpected results. You may want to completely change the topic if something unexpected shows up.
12. Working logically through your results to support or reject your hypothesis.
13. Writing a report to tell others what you did and what you found, based on experiments you carried out.
14. The experimental report is **NOT** a library research assignment nor a scientific literary review. These cannot be judged.

### Writing an experimental research report

- ✓ Tick that you have satisfied each of the guidelines and criteria below.

#### Entry guidelines

Your report format may be written in passive or active voice but must include the following headings:

- Abstract** – Give a brief description of what you did and what you achieved. Around 100 words should suffice.
- Introduction** – This must be relevant to the topic and explain why you chose this topic. It must define key terms and provide some background information as well as answering the question “what were you looking at?” Some information from your background reading would be useful.
- Aim** – this must give a clear indication of your investigation. Include your specific hypothesis.
- Materials** – List or describe the equipment you used to carry out your experiment.
- Method** – Presentation of the method should allow someone else to follow your experiment step by step. Method should report what was actually done, not what you should do. Include any mistakes.
- Remember to include a description of the **safety precautions** you used to conduct the experiment. Attach **Risk Assessment Form**, sample provided on page 24.
- Observations and Results** – Present your results in an easily understood format which may include tables, graphs, photos, maps and descriptions. All information should be clearly labelled. Where possible, results should involve measurement. Avoid subjective results such as those involving likes and dislikes.
- Discussion** – Judges pay particular attention to the quality of your discussion. Analyse what your results show. Discuss the implications and validity of your results. Did your results support or reject your hypothesis? What problems did you encounter? How could you improve on your experimental design or data collection? What errors did you make? Reflect on unexpected results.
- Conclusion** – The conclusion must relate to the aim. Has the hypothesis been supported or rejected?
- Acknowledgements and references**  
A reference list must be included. All research is based on some background information. You should list the books, journals and websites you referred to. Acknowledge the people who gave you help or advice and explain in what ways they helped you. Specific information from another source, when used, must be cited. See page 24 for methods of citing others' work.
- When finished ask your teacher or parent(s) to check your report to make sure it follows the guidelines.
- Keep a full electronic copy of your work**, including scans of log book etc. See page 24 for naming your file
- Posters, videos and other accessories are not judged.

#### Entries must be electronically submitted

Project files should be given to your teacher at least a week before the due date.

Online submission portal closes: 23 July 2023

All guidelines should be followed to avoid being disadvantaged during judging.

# CLASS EXPERIMENTAL RESEARCH PROJECT

## LOWER, MIDDLE AND UPPER PRIMARY

The class experimental research project provides the opportunity for a class to engage in experimental research of greater scope than would be possible within the experimental research section of the competition. This could be achieved by choosing to investigate a hypothesis in great depth or a set of linked hypotheses.

1. This section is for Lower, Middle and Upper Primary students only. There is a maximum of 8 entries per school across the 3 divisions.
2. The project **must** be based around the investigation of a hypothesis (question) through experimental research.
3. All students listed within the class entry must be involved in the project.
4. The topic or theme is unrestricted **however**, students will be judged on the:
  - level of student involvement in decision-making
  - scientific skills and knowledge gained by students
  - quality of science within the project
  - ability to extend their learning and knowledge beyond the science class room
  - originality and creativity of the topic.
5. A representative group of 4 to 6 students will need to present the class project on the Judging Day.
6. **Country entrants** are strongly encouraged to attend the Judging Day. Country entrants who cannot attend the Judging Day are required to record a 5 minute video presentation answering the questions listed in the oral presentation section of the guidelines. This should be sent along with their entry. **Please notify STAV via email that you will not be attending the Judging day.**
7. The class needs to be clearly identified eg. Victoria Primary School – Year 1, Class XXX
8. A complete bibliography must be included along with acknowledgment of any assistance from teachers and other adults. See page 24 to reference correctly.

### Entry guidelines

The class project consists of **three compulsory** parts.

- The written scientific experimental research report
- Evidence of class involvement
- An oral presentation on Judging Day (or a video for country entrants).

Each part should be presented according to the following guidelines:

#### Scientific Research Report

The research and written report must follow the guidelines for 'Writing an experimental research report' Lower, Middle and Upper Primary Division found on page 10 of this STS handbook. Both passive or active voice is **equally** acceptable.

- The report must be stapled or bound together with a cover or in a manila folder. **No loose paper or paper inside plastic sleeves will be judged. The Yellow Face Sheet must be firmly attached to the front cover.**

- Bibliography and acknowledgment list for the whole project should be attached to the back of the Report.

#### Evidence of Class Involvement

Evidence must demonstrate the participation of the class, and assist the children attending the oral presentation to explain the scientific learning that has taken place.

**All evidence must be the work of the children.**

Evidence may include:

- Children's experimental notes, drawings and diagrams.
- Photographic poster
- Model
- Products of the experimental investigation

The evidence must be easily transportable, carried by up to three students.

If using a computer program/DVD as part of providing evidence you must provide your own laptop and ensure the students can run it independently.

Any assistance that the children receive in producing and compiling the evidence must be clearly acknowledged.

#### Oral Presentation

- When/if preparing your oral presentation focus should be on the results and discussion sections of the project. The Aim, Method and Materials will be judged from the written report and will not require reading out.
- Judges look favourably on the ability for students to communicate the science beyond the initial investigation and the understanding of errors in science. (Part of discussion in written report).
- A small group of 4 – 6 children representing the class need to attend Judging Day and present their entire project at a designated time.
- Possible questions asked may include but are not limited to:
  1. What decisions did your class have to make during the experimental research?
  2. What science have you learnt from doing this research project?
  3. When doing experimental research what important skills must you use?
  4. How was the workload distributed amongst the members of your class?
  5. How does the scientific learning extend beyond the classroom (wider world applications)
  6. Science celebrates errors. What problems and/or errors occurred during the experimental process?

#### Submit your entry/report electronically

Metropolitan schools must take their projects to Judging Day at Methodist Ladies' College, Kew with their group representatives on Saturday 5 August 2023. Schools with Class Project entries will be contacted prior to judging day and be allocated a judging time.

All guidelines should be followed to avoid being disadvantaged during judging.

### Topics for 2023

- Your picture story book must BE ONE OF THE BELOW TOPICS and relate to the theme **Innovations: Powering Future Industries**
- Create a science picture story book based on this theme using one of the following topics.

**Note: These are the ONLY topics that will be judged.**

#### Primary

1. The clever tractor on my farm
2. Hello, welcome to my smart home
3. The factory that managed itself
4. My friend the drone can do...

✓ **Tick that you have satisfied each of the guidelines and criteria below.**

### Entry guidelines

- Your picture story book must **BE ONE OF THE ABOVE TOPICS**. If you have a different title, please print the topic on your Face Sheet and Story Book.
- The creative writing and pictures must be done as an imaginative fictional story (detective, horror, drama, biography, etc.)
- You must incorporate factual scientific information into your pictures and words. Your story should convey science concepts through pictures supported by minimal text.
- A list of at least 5 key science ideas you used in developing the picture story book (with a brief explanation) must be included as an appendix. Picture Story Books without scientific content worked into the story and pictures do not rate highly.
- You must include a Bibliography at the end of your book listing all the books, magazines, websites that you have referred to or used. You must use a range of these resources. See page 24 for "How to list a Bibliography".
- Make sure you include a list of people who gave you help and advice and explain in what ways they helped.
- Typed or printed scripts are easier to read, but this is not essential if your handwriting is clear. The Judges will take notice of presentation, so it is important that your book is neat and looks attractive. Picture story books will be penalised for poor presentation.
- Pictures must be hand drawn or produced on a computer. Clip Art or downloaded illustrations won't rate highly and may infringe copyright requirements. Any art medium is allowed.
- Picture story books for Lower Primary (Foundation – Year 2) can be up to 200 words in length. Middle and Upper Primary (Year 3 – Year 6) entrants must be between 100 and 300 words in length. A **word count** must be included at the end of the book. The word count is applicable to the story only.
- Students are advised to keep an electronic copy of their work (scan a copy as back up).

### Judging criteria

Your picture story book will be judged according to the following criteria:

#### Scientific content including:

- identification of basic scientific ideas
- accuracy of scientific ideas
- appropriate amount of scientific content
- integration of science ideas into your pictures and story
- 5 key science ideas in appendix

#### Expression and Presentation including:

- grammar and spelling
- clarity of expression
- use of own words
- development of story line
- originality and creativity

#### Format including:

- variety of resources used
- creativity of format
- interest and entertainment of pictures and story
- quality of conclusion
- length within the maximum word count.
- bibliography and acknowledgement of assistance given by others.



#### Tip for hand-made picture story books:

We recommend that students keep their work unbound and numbered before scanning their pages for electronic submission.

#### Entries must be electronically submitted

Project files should be given to your teacher at least a week before the due date.  
Online submission portal closes: 23 July 2023

All guidelines should be followed to avoid being disadvantaged during judging.

# CREATIVE WRITING

## JUNIOR, INTERMEDIATE AND OPEN DIVISIONS

### Topics for 2023

Your creative writing piece must relate to the theme

#### Innovations: Powering Future Industries

**Note: The following FOUR topics are the ONLY topics that will be judged.**

Secondary

1. I'm an eDNA scientist
2. Our planet in 2100
3. How the eye in the sky changed my life
4. My AI innovation...

✓ **Tick that you have satisfied each of the guidelines and criteria below.**

### Entry guidelines

- Your creative writing must follow one of the above topics. Please include your chosen topic on the first page of your **Entry** and also your **Face Sheet**.
- The creative writing must be done as an imaginative story in any genre eg. detective, horror, drama, biography, and in the format of an **essay** or any other style such as **comics, cartoons, graphic novels, diary, letter** and so on.
- You must incorporate scientific information in your story.
- A list of at least 5 key science ideas that you used in developing your story with a brief 2-3 sentence explanation must be included as an Appendix. The Judges will be looking for scientific content worked into the story.
- You must include a Bibliography at the end of your entry in which you list all the references eg. books, journals, websites you have used or referred to. Specific information from another source, when used, must be cited. See page 24 for methods of citing others' work. Note the guidelines for websites.
- Acknowledge people who gave you help (if any) explain the ways they helped.
- Typed or printed scripts are easier to read, but this is not essential if your handwriting is clear. The Judges will take notice of presentation, so it is important that your entry is neat and looks attractive. Poor presentation will be penalised. Grammar and spelling should be correct.
- Illustrations may be hand drawn or produced on a computer. Clip Art or downloaded illustrations are not acceptable and may infringe copyright laws.
- Your writing should be 500 to 1000 words in length. Entries over the word limit will be penalised. A **word count** must be included on the last page of your entry.
- Students are advised to keep an electronic copy of their work (scan a copy as back up).

### Judging criteria

Your entry will be judged according to the following criteria:

#### Scientific content including:

- appropriate amount of scientific content
- integration of science ideas into your creative writing
- identification of basic scientific ideas
- accuracy of scientific ideas
- Appendix of 5 key science ideas with a brief 2-3 sentence explanation (see STS website for examples).

#### Expression and Presentation including:

- grammar and spelling
- clarity of expression
- use of own words
- development of story line
- originality and creativity.

#### Format including:

- interest of story beginning
- variety of resources used
- creativity of format
- interest and entertainment in reading the story
- quality of ending
- length within the maximum word count
- Bibliography (refer to page 24).

#### Entries must be electronically submitted

Project files should be given to your teacher at least a week before the due date.

Online submission portal closes: 23 July 2023

All guidelines should be followed to avoid being disadvantaged during judging.



Students are encouraged to explore ANY scientific area of interest.

Design a device to solve a real world problem.

### What is an invention?

Inventions are original devices or applications of technology which solve a problem. The scope for inventions is limited only by your imagination. You are asked to apply your knowledge of science to make a **WORKING** invention that has a practical application. Your invention may be a new device, method or process that has not existed before or you may choose to look at an existing device and invent a solution that works better.

**Note that Inventions is a separate section to Information and Scale Models. See page 16 for information about the Working Models section.**

✓ **Tick that you have satisfied each of the guidelines below.**

### Entry guidelines and criteria

- Your invention must be presented as a **WORKING** invention.
- Your invention is to be no larger than 0.5m x 0.5m x 0.5m and weigh no more than 15 kg unless special permission is granted by the STS Coordinator.
- Your invention must be safe to operate in a crowded area and must have appropriate safety features (e.g. boilers must have correctly operating safety valves). Dangerous chemicals must not be used and rocket- type inventions will not be judged. Projects that involve cruelty to animals will not be judged.
- Your invention solves a real problem.**
- Your invention is well constructed.
- You have shown resourcefulness in the parts you have chosen to use including consideration of properties of the materials.
- Your invention includes a **design brief** that clearly shows the scientific principles involved and/or how it applies to the invention.
- Your invention is easy to use and comes with instructions on how it operates.
- Your invention demonstrates a high level of applied scientific principles.**
- Your invention is highly **original, innovative and inventive**. (Scale models of existing devices should be entered in the Working Models section.) Be sure to research thoroughly that your invention has not been tried already.
- Due to safety standards, STS recommends students use their own battery pack for power.

### Written report

Include with your invention a written report that has the following:

- Aim(s)** – Explain the purpose of your invention and how it solves a problem
- Introduction** – Explain what is original or new about your invention, your ideas behind it and how your invention is important or relevant to an existing problem.

- Instructions** – List operating instructions of your invention.
- Design brief** – Describe how you went about building and testing, problems you encountered and how they were solved, and the science principles used and applied to the design. **Draw and label diagrams of your prototype designs**, including relevant explanations.
- List any safety considerations in your design. Attach **Risk Assessment Form**, see sample on page 24.
- Discussion** – Discuss the scientific principles involved and how they apply to the invention. Explain how your invention solves a problem. Analyse and include the results of your field tests. Describe the limitations of your design and suggest how you would make further improvements.
- Acknowledgements and References** – Make sure you include a list of people who gave you help/advice and outline the ways they helped you. Also list other sources of information used (refer to page 24).
- Include a photo(s) of your invention in your report.
- Your report should be no more than 1000 words in length, (word count does not include any appendix or logbook attached) on A4 paper and presented in a paper manila folder (not plastic) with a copy of the completed Face Sheet firmly attached to the front.
- Keep a full electronic copy of your work**, including scans of your log book etc. See page 24 for naming your file

### Video of your oral presentation

Students will be expected to give an oral presentation that demonstrates to the judges how the invention works and discuss the following aspects: (3-5 minutes)

- How to use the device.
- How it solves a real world problem.
- How your invention is original, innovative and/or inventive.
- The function of the device (i.e. how well does it work?).
- The design of the device (i.e. parts and materials used/ suitability/design brief) problems you encountered and how you overcame them.
- What scientific principles does your device demonstrate?** (Your understanding of the science in the design and application).
- You must show your **device in operation**.

Judges will look for evidence of depth of research into the science behind your Invention.

**\* Oral presentation video must be uploaded to a file sharing site and must not require a password.**

Submit your project electronically and attend  
**JUDGING DAY FOR INVENTIONS**

**Saturday 5 August 2023**

Parade College (TBC),  
1436 Plenty Road, BUNDOORA

# WORKING MODELS

## ALL DIVISIONS

Students are encouraged to explore ANY scientific area of interest.

### Scale models

This is a scaled representation of an **existing** device/ invention. You are asked to make a WORKING model that simulates the operation of, and the scientific principles behind, an existing technology. You should choose a model which clearly illustrates a scientific principle. For example, you could construct a scale model of an operating small scale radio telescope demonstrating the process of receiving radio waves.

### Information models

Information models are WORKING models that either demonstrate a scientific principle or concept, or simulate a scientific technique. These models are intended to educate people about the concept being illustrated. For example, if you wanted to show how electrons flow through a wire you couldn't use electrons (because they are too small) but would use something large enough to see to represent the electrons.

**Note that Information and Scale Models is a separate section to Inventions. See page 15 for information about the Inventions section.**

✓ Tick that you have satisfied each of the guidelines and criteria below.

### Entry guidelines and criteria

- Your model must be a WORKING model.
- Your model must be no larger than 0.5m x 0.5m x 0.5m, and weigh no more than 15 kg unless special permission is granted by the Science Talent Search Section Coordinator.
- Your model must be safe to operate in a crowded area. All models must have appropriate safety features; e.g. boilers must have correctly operating safety valves. Dangerous chemicals must not be used, and rocket models will not be judged. Projects that involve cruelty to animals will not be judged.
- Your model must be original (volcanoes will score poorly!!). Models made from kits without original input do not score well.
- The best Scale models clearly and accurately illustrate only one or two scientific concepts. These should be the major concepts in the operation of the model.
- Information models show original, creative and innovative presentation.
- Your Model is well constructed.

- You have shown resourcefulness in the parts you have chosen to use, including consideration of properties of the materials.
- Your Model is easy to use and has operating instructions.
- The scientific principle used is clearly understood and demonstrated.
- Due to safety standards, STS recommends students use their own battery pack for power.

### Written report

Include with your Model a written report that has the following:

- Introduction** – What the model represents and ideas behind it. Identify your model either as a scale model or an information model.
- Design brief** – Describe how you went about building and testing, problems you encountered and how they were solved, and the science principles used and applied to the design. **Draw and label diagrams of your prototype designs**, including relevant explanations.
  - Scale model: Address how suitable your model is in the explanation of the science principle(s) being demonstrated. Also include how accurate your scale model is and note where exceptions were made to the size ratio.
  - Information model: Show original, innovative and creative design in the implementation of the scientific principle(s) being demonstrated.
  - List any safety considerations in your design. Attach **Risk Assessment Form**, see sample on page 24.
- Instructions** – List operating instructions of your model.
- Discussion** – Discuss the scientific principles involved and how they apply to the Model. Describe the limitations of your design and suggest how you would make further improvements.
- Acknowledgements and References** – Make sure you include a list of people who gave you help/advice and outline the ways they helped you. Also list other sources of information used (refer to page 24).
- Include a photo(s) of your Model in your report.
- Your report should be no more than 1000 words in length, (log books and appendices are not included in word count) on A4 paper and presented in a paper manila folder (not plastic) with a copy of the completed Face Sheet firmly attached to the front.
- Keep a full electronic copy of your work**, including scans of your log book etc. See pg 23 for naming your file.

## Video of your oral presentation

Students will be expected to give an oral presentation that demonstrates to the judges how the Model works and discuss the following aspects: (3-5 minutes)

- How to use the device.
- The function of the device (i.e. how well does it work?).
- *For Scale Models* – The accuracy of the scale model and its suitability in demonstrating the scientific principles and/or concepts.
- *For Information Models* – How your model is original/creative in demonstrating the scientific principles and/or concepts.
- The design of the device (i.e. parts and materials used/suitability/design brief) problems you encountered and how you overcame them.
- What scientific principles does your device demonstrate? (Your understanding of the science in the design and application).
- You must show your device in operation.

**Judges will look for evidence of depth of research into the science behind your Model.**



Submit your project electronically and attend  
**JUDGING DAY FOR WORKING MODELS**  
**Saturday 5 August 2023**  
 Parade College (TBC),  
 1436 Plenty Road, BUNDOORA

All guidelines should be followed to avoid being disadvantaged during judging.

# POSTERS – SCIENTIFIC WALLCHARTS

## LOWER, MIDDLE AND UPPER PRIMARY DIVISIONS

### Topics for 2023

The theme for Posters is **Innovations: Powering Future Industries**

**Note: These are the ONLY topics that will be judged.**

Primary

1. Robots saving lives
2. Innovations for a sustainable future
3. Technology and sustainable agriculture
4. Welcome to my smart house

✓ Tick that you have satisfied each of the guidelines below.

### Entry guidelines

You are required to:

- Give a clear explanation of the scientific and technical principles involved (refer to the diagrams you have used that help illustrate these principles)
- Explain the significance and impact that the topic has in the real world (refer to the diagrams you have used that help illustrate these principles)
- Include at least 3 relevant diagrams which summarise the two guidelines above
- List acknowledgements and references used. Put these in a **small box** at the **bottom right hand corner** of the poster.
- Maximum poster size is 80cm x 60cm. The minimum size that will be accepted is 60cm x 40cm.
- Use flexible poster paper that can be easily rolled up.
- All diagrams and text must be original.
- Firmly attach the Entry Face Sheet to the back of your poster.**
- Text must be in your own words. It may be hand written or produced via computer. The text needs to be concise (use just enough words to explain the topic ideas when a person looks at the poster/chart for a couple of minutes.)
- Written information must be legible (visible from 1 metre) and contain a major heading for the topic and sub-headings (visible from 2 metres) for ideas/concepts within the topic.
- Maximum word limit is 400 words, including headings, explanations and captions; excluding bibliography
- Diagrams may be either hand drawn or produced using tools on a computer. Diagrams copied from other software or downloaded are not acceptable.
- Scanned pictures, photographs of pictures and photographs are not acceptable on any part of your poster.
- Diagrams must be referred to in the text and have clear headings/labels and be distinguishable from a distance of 2 metres.

- Diagram labels/headings are not included in the word count.
- Posters must not have any built-up or three-dimensional sections.
- If you have stuck or attached any diagrams or writing to the poster, you must laminate or 'contact' it, so that there are no loose edges protruding from it.
- You will be expected to answer questions from the judges about your poster.
- Judges will look for evidence of accurate and relevant scientific content, understanding of the material presented, and depth of investigations, innovative and creative thought in the visual presentation and in the selection of ideas investigated.



#### Country / Jewish / Special Metro Entrants

Electronically submit your poster as well as an oral presentation video answering the following questions.

- State the topic you have chosen and how it relates to this year's theme.
- Explain the scientific and technical principles involved (refer to the diagrams you have used).
- Explain the significance and impact that the topic has in the real world (refer to the diagrams you have used).
- Address Poster guidelines: Poster size, text visible from 1m and word limit.
- Make sure to show the poster in your oral presentation.

Submit your project electronically and attend

**JUDGING DAY FOR POSTERS**  
**Saturday 5 August 2023**

Methodist Ladies' College  
Fitzwilliam Street Entrance, KEW

All guidelines should be followed to avoid being disadvantaged during judging.

# POSTERS – SCIENTIFIC WALLCHARTS

JUNIOR, INTERMEDIATE AND OPEN DIVISIONS



## Topics for 2023

The theme for Posters is **Innovations: Powering Future Industries**

**Note: These are the ONLY topics that will be judged**

Secondary

1. AI Innovations – Energy for future generations
2. Robots saving lives
3. AI in the workplace
4. Innovations for a sustainable future

✓ **Tick that you have satisfied each of the guidelines and criteria below.**

## Entry guidelines

You are required to:

- Give a clear explanation of the scientific and technical principles involved (refer to the diagrams you have used that help illustrate these principles)
- Explain the significance and impact that the topic has in the real world (refer to the diagrams you have used that help illustrate these principles)
- Include at least 3 relevant diagrams which summarise the two guidelines above.
- List acknowledgements and references used. Put these in a **small box** at the bottom right hand corner of the poster.
- Maximum poster size is 80cm x 60cm. The minimum size that will be accepted is 60cm x 40cm.
- Use flexible poster paper that can be easily rolled up.
- Firmly attach the Entry Face Sheet to the back of your poster.**
- All diagrams and text must be original.
- Text must be in your own words. It may be hand written or produced via computer. The text needs to be concise (use just enough words to explain the topic ideas when a person looks at the poster/chart for a couple of minutes.)
- Written information must be legible (visible from 1 metre) and contain a major heading for the topic and sub-headings (visible from 2 metres) for ideas/concepts within the topic.

- Maximum word limit is 400 words, including headings, explanations and captions; excluding bibliography
- Diagrams may be either hand drawn or produced using tools on a computer. Diagrams copied from other software or downloaded are not acceptable.
- Scanned pictures, photographs of pictures and photographs are not acceptable on any part of your poster.
- Diagrams must be referred to in the text and have clear headings/labels and be distinguishable from a distance of 2 metres.
- Diagram labels/headings are not included in the word count.
- Posters must not have any built-up or three-dimensional sections.
- If you have stuck or attached any diagrams or writing to the poster, you must laminate or 'contact' it, so that there are no loose edges protruding from it.
- You will be expected to answer questions from the judges about your poster.
- Judges will look for evidence of accurate and relevant scientific content, understanding of the material presented, and depth of investigations, innovative and creative thought in the visual presentation and in the selection of ideas investigated.

### Country / Jewish / Special Metro Entrants

Electronically submit your poster as well as an oral presentation video answering the following questions.

- State the topic you have chosen and how it relates to this year's theme.
- Explain the scientific and technical principles involved (refer to the diagrams you have used).
- Explain the significance and impact that the topic has in the real world (refer to the diagrams you have used).
- Address Poster guidelines: Poster size, text visible from 1m and word limit.
- Make sure to show the poster in your oral presentation.

Submit your project electronically and attend

**JUDGING DAY FOR POSTERS**  
**Saturday 5 August 2023**

Methodist Ladies' College  
Fitzwilliam Street Entrance, KEW



All guidelines should be followed to avoid being disadvantaged during judging.

# GAMES

## ALL DIVISIONS

You may choose any topic that is based on a real issue. This year's theme is **Innovations: Powering Future Industries**, so you could base your game around that.

Your entry does not have to be a board game. There are many other ways in which games can be played. Why not design a card game which teaches a scientific idea, or think of ways in which players use stories or drawings or perhaps act out scientific events. Just make sure your game meets the entry guidelines listed below. The judging criteria will be sufficiently broad to cater for different kinds of games. The judges will be looking for games which are original and creative and not too closely modelled on existing games. Computer games must still be entered in the Computer Programs section.

✓ Tick that you have satisfied each of the guidelines below.

### Entry guidelines

Produce a game which:

- presents a scientific idea.
- shows evidence that research was used to develop the game.
- aims at finding solutions to real issues (eg. rather than a game based on 'water', base it on water pollution).
- is interesting and clear.
- is educational and involves the players in completing tasks, answering questions and making decisions.
- if it is a board game, avoids having players land on "luck" squares and being sent off without teaching them anything or finding out if they know anything.
- has a high level of Scientific processing in tasks set for the players.
- has tasks that promote problem solving and concept development rather than questions that require recall of facts. If you ask questions, don't make them trivial or obscure.
- The game must be original and fun to play.
- The game should be attractive, well presented, self-contained in a box and labelled on the outside. Ensure that all of the appropriate numbers of pieces or playing parts are securely packaged.

### Written Report

- Aim:** Explain the purpose and aim of your game.
- Age:** Specify the age group the game is aimed at and make it appropriate for the target audience.
- Instructions:** Include a clear set of step-by-step instructions or rules.
- Discussion:** Include a statement on what aspect of science the game is intended to teach. This should be about one A4 page in length.
- Acknowledgements:** Make sure you include a list of people who gave you help/advice and outline the ways they helped you.
- References:** Include all reference material used (refer to page 24).

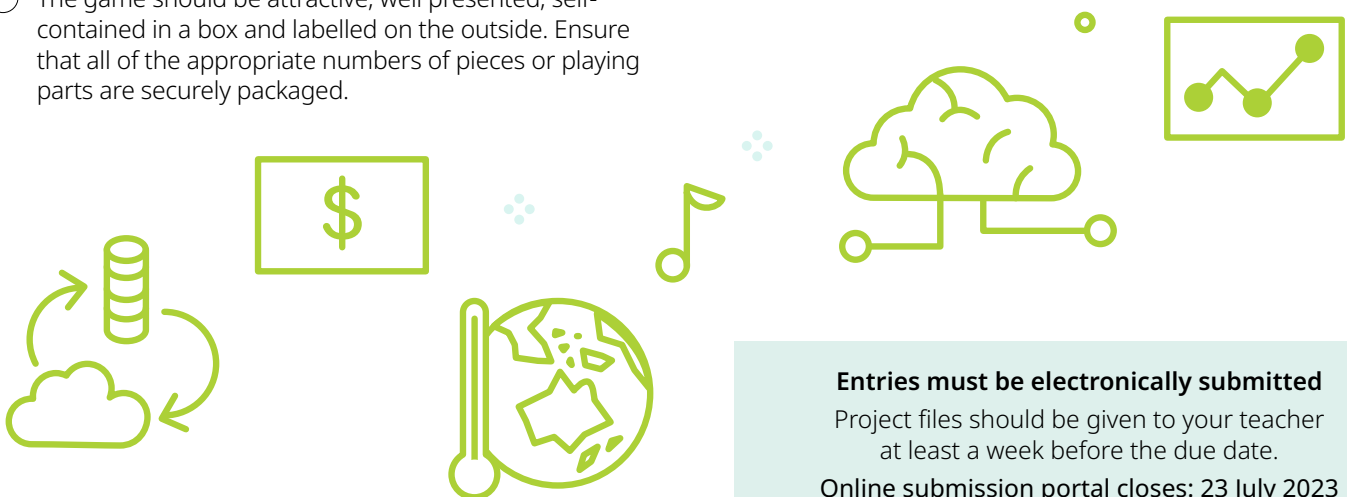
### Video of your oral presentation

Students will be expected to give an oral presentation that demonstrates to the judges how the game works and discuss the following aspects: (3-5 minutes)

- Introduce your game: target audience, topic you have chosen, how the game works (instructions and rules), the aim of the game (and how a player achieves success of aim), and the issue(s) involved.
- Demonstrate** your game explaining:
  - The **science** the game is intended to teach.
  - How it promotes problem solving and concept development.
  - Play the game in action through your presentation.

Judges will look for evidence of depth of research and understanding into the science behind your game.

\* Oral presentation video must be uploaded to a file sharing site and must not require a password.



### Entries must be electronically submitted

Project files should be given to your teacher at least a week before the due date.

Online submission portal closes: 23 July 2023

All guidelines should be followed to avoid being disadvantaged during judging.

Create a computer program to communicate your chosen Science topic!

It can be a game, simulation or both but must be Interactive and not just a presentation of information. Although you are encouraged to follow this year's theme, you may choose to explore a scientific topic of your choice.

*Below are the Requirements and Guidelines. You can tick each to make sure you have everything you need!*

### Requirements:

The program must be written in a general purpose programming language. For example: Scratch, Python, Javascript, C# etc.

Your simulation/game should run for less than 5 minutes – it may run for more than this but the judge should be able to get a comprehensive experience of the program within 5 minutes.

#### Cover Page – 1 A4 page maximum

- Title
- Science Topic
- Web link to a copy of your program. See page 24 for how to name your file! (Dropbox, Google Docs, Microsoft One Drive, etc)
- Programming Language used
- Operating System used
- Instructions on how to run the program

#### Written Report – 1 A4 page maximum

- Describe your program
- What does the user do? Where do they start, where do they finish?
- Describe the science in your program
- Describe how the program integrates the science
- Bibliography: a list of references used, cited in the correct format (refer to page 24)
- Acknowledgements – Make sure you include a list of people who gave you help/advice and outline the ways they helped you.

### Judging Day

Be prepared to discuss both the science and the program used in your entry with a Judge on the Judging Day.

All Students attending Judging day MUST bring their own Computer equipment. If web connection is required, that is also the entrant's responsibility. No responsibility will be taken by STS for lost or damaged equipment.

### Video guidelines

Country, Special Metro or Jewish School entrants are encouraged to attend Judging Day with their computer program and computer hardware to discuss their entry with Judges. If this is not possible entrants must include a written statement with their entry (not more than two A4 pages) summarising the scientific principles demonstrated by their program, and submit this electronically with an oral presentation video.

**Part One (3-5 minutes) – This part is in the event your program does not run for the judge.**

1. Close up video of the Computer Program screen as you fully demonstrate the program itself.
2. You may narrate as you move through the program demonstration.

**Part Two (3-5 minutes) – This is your oral presentation.**

1. Aim and purpose of the program (don't forget to include the age range your program is intended for).
2. Summarise the scientific idea and content of the program.
3. Explain how you 'programmed' or created your project, including the programming language you used.
4. Provide a link to the game/program as well as instructions on how to play the game.

\* Oral presentation video must be uploaded to a file sharing site and must not require a password.



Submit your project electronically and attend  
**JUDGING DAY FOR COMPUTER PROGRAMS**  
**Saturday 5 August 2023**  
Methodist Ladies' College  
Fitzwilliam Street Entrance, KEW

All guidelines should be followed to avoid being disadvantaged during judging.

# SCIENCE PHOTOGRAPHY

## ALL DIVISIONS

In this section you are asked to submit photographs which record some scientific event or illustrate some scientific phenomenon. You may submit between three and six photographs, which must be linked by a common theme. Be careful to prepare prints that are suitable for display. Your topic may be based on **any** scientific theme or you may use the theme for this year.

Prints that indicate cruel or dangerous procedures have been used, will not be judged.

✓ **Tick that you have satisfied each of the guidelines and criteria below.**

### Entry guidelines

Students must submit their prints, **and** original images or negatives and a written report according to the following guidelines. The entire entry must be presented in a **document wallet** with a copy of the Yellow Face Sheet attached to the back.

#### Prints

- Submit only 3 – 6 photos.
- Each print must be separately mounted on thick card (not paper) no bigger than A4 size. Professional mounting is not required. Prints are for display. Book, poster and collage format are not allowed.
- Each separately mounted print must include:
  - Title on the front
  - a caption on the front that explains the scientific relevance in 1-2 sentences
  - the student's name(s) and school on the front
  - labels on the back of all parts of the entry, with photographer's name, school and STS code.
- Photographs must be taken by the entrant using a traditional or digital camera (with traditional photography students are not required to develop their own photos). Any enhancements to photographs either digital or traditional must be done by the student.
- Images **cannot** be taken from other print or electronic sources.
- The official yellow face sheet must be signed by a teacher **and/or** parent/guardian. Without this signature verifying originality the entry will not be eligible for a bursary. (The face sheet is sent to schools after entries are registered).

#### Original images

- Digital Photography:** all original, unaltered images must also be provided on **ONE** separate A4 sheet of paper as part of the explanation of the process undertaken, regardless of whether you altered the final images.
- Traditional Photography:** the negatives must be supplied (attached to one A4 sheet of paper).

#### Written report

- The entry must include a written report following the guidelines below and not more than 800 words. Entries without reports will not be eligible for a bursary.

This report should be set out as follows:

- **Aim** – State clearly what you intended to do in terms of your topic and the photography.
- **Method** – State clearly how you set up and took your photographs (images). Include information about the type of camera, other hardware and software you used and how you altered the images (if relevant).
- **Scientific Content** – Describe the scientific principles or ideas you are displaying in your photographs and the relevance of the particular photographs you have selected.
- **Bibliography/Acknowledgements** – see page 24

- The report and mounted photographs must be presented in a **document wallet** with a copy of the completed Yellow Face Sheet firmly attached to the back.

### On Judging Day

- Students need to be prepared to discuss their entry with a Judge. An understanding of the scientific content of the photographs and explanation of techniques used to produce the photographs will be the focus of the discussion.

**When assessing entries judges look at the following criteria:**

- a. all handbook guidelines for photography have been followed
- b. explanation of the scientific topic/theme
- c. **scientific relevance** of photographs
- d. technical skill in producing the photographs
- e. dramatic impact and presentation.

#### Video guidelines

**Country, Jewish Schools and special metro entrants** may submit their entries electronically with an oral presentation video answering the following questions.

1. Introduce your project: Aim and topic.
2. Explain the scientific principles/topic behind your photos and why you chose the images.
3. Explain the techniques you used to produce your photos/images.

**\* Oral presentation video must be uploaded to a file sharing site and must not require a password.**

Submit your project electronically and attend

**JUDGING DAY FOR PHOTOGRAPHY**  
**Saturday 5 August 2023**

Parade College (TBC),  
1436 Plenty Road, BUNDOORA

All guidelines should be followed to avoid being disadvantaged during judging.



# VIDEO PRODUCTIONS

## ALL DIVISIONS



Your video, should focus on areas of science where motion, colour and sound are important. Although you are encouraged to follow this year's theme, you may explore a scientific topic of your own choice.

✓ Tick that you have satisfied each of the guidelines below.

### Entry guidelines

- Assessment of video productions will include:
  - the science content
  - originality, creativity, and clarity of thought
  - impact on the viewer
  - video skills
- Ensure your video does not simply display a technique used in science (eg. how to safely light a Bunsen burner); emphasise the **science** involved (eg. why is the flame blue or yellow?)
- Since technical quality is important, you should use a good quality camera for your original recording and editing software to keep the original resolution.
- With videos there will be times when 'extras' are called for either to act or hold the camera, so the entrants can appear in the recording. This does not contravene the entry requirements of Science Talent Search as long as the two students recorded on the entry form are the driving force behind the production and any help has not brought with it a level of presentation beyond the skills of the entrants in the group.
- Some useful techniques might be:
  - Editing segments of your video.
  - Adding music.
  - Time lapse sequences.
  - Superimposed graphics or lettering.
  - Zooming.
  - Fading in and out.
  - Audio level adjustment.
- Your entry must be an original work, generated by you and definitely not recorded from some other person's video recording and not entered in a previous year.
- The entry must be self-contained. Your program must not rely on any other additional material such as posters, audiocassettes, notes or specimens. It will be judged on its own merits.
- All videos – See page 24 for naming your file.
- The entry **MUST** be submitted electronically as a **weblink** via the school portal. Use any movie-making software to create your video. You must state the program you used to produce your video.
- You must bring your own laptop to play your video on Judging Day. **Your school STS coordinator MUST submit your video online prior to the judging day.** Preferred video formats MKV, WMV, MPEG, MP4, MOV, AVI, XVID, FLV, FLAC, REAL, VOB, ASF and OGG).

- The program must end with a list of credits, including a list of video equipment used, software, titles or any scientific references consulted and an acknowledgment of any help received.
- The program running time must not exceed 5 minutes. (This includes the credits.)
- You need to be prepared to discuss your entry with a Judge on the Special Judging Day. An understanding of the scientific content of the video and explanation of techniques used to produce the video will be the focus of the discussion.

\* Video project *and* oral presentation video must be uploaded to a file sharing site and must not require a password.

### Video guidelines

Country, Jewish Schools and special metro entrants not attending judging day must include an additional 3 – 5 minute segment at the end of your video featuring your teacher asking the following questions and the student(s) answering:

**Part 1 – Your Video project (no more than 5 minutes)**

**Part 2 – (This is your oral presentation for non judging day entrants to be added to your Video Production – 3-5 mins)**

1. What inspired you to do this topic?
2. Tell us about your video (what do you expect the audience to see?).
3. What scientific principles are demonstrated by your video?
4. What resources did you use?
5. Did anyone help you put together the show? Who did the camera work?
6. How long did it take to do?
7. What did you learn?
8. Did you have to edit? How did you do this?

Submit your project electronically and attend

**JUDGING DAY FOR VIDEOS**  
**Saturday 5 August 2023**

Parade College (TBC),  
1436 Plenty Road, BUNDOORA

All guidelines should be followed to avoid being disadvantaged during judging.

# HOW TO CITE REFERENCES AND WRITE A BIBLIOGRAPHY

## What needs to be cited?

Some information that you use in a **report** or **project** need to be referenced. The type of information that should be referenced includes factual data (dates and numerical figures), graphs, diagrams and others' opinions. You should also acknowledge any assistance given by other people.

## Methods of citing others' work

There are a number of methods used to cite other people's work. Two common ways are described in the examples below.

### Example 1: (Using footnotes)

- Factual information in text: The LD50 is the amount per kilogram body mass which will kill half the animals it is given to.<sup>1</sup>
- Footnote 1: (at bottom of page)  
Coghill Graham (1985) *Sciencescope 2*, Heinemann Educational Australia p 167

### Example 2:

(Acknowledging the source in brackets directly after the statement)

- The LD50 is the amount per kilogram body mass which will kill half the animals it is given to (Coghill, 1985, p167).

## How to list a bibliography

The system used to cite information must be supported by a bibliography. A bibliography is a list of all the sources of information you used (eg. books, journals, magazine and newspaper articles, TV broadcast, videos, personal interviews, websites, etc.)

For books, you should write:

Author(s), year, title of book, edition, publisher information, page number.

eg. Coghill, Graham (1985) *Sciencescope 2* Heinemann Education Australia, p167

For journals and other articles:

Author(s), title, article, source, edition, information, page

eg. Lemonick, Michael. *Are We Ready for Fat-Free Fat?* *TIME* (January 22, 1996) pp 40-46

For web sites:

- Name of article/source
- Date article placed on the web or last updated (if available)
- URL address
- Date and time accessed

eg. NASA Ozone Watch (Updated 18-10-2018)

[https://ozonewatch.gsfc.nasa.gov/facts/ozone\\_SH.html](https://ozonewatch.gsfc.nasa.gov/facts/ozone_SH.html)  
(Accessed: 06-01-2022, 6.08pm)

## Acknowledgements


Make sure you include a list of people who gave you help / advice and outline the ways they helped you.

Electronic copies of your project should be saved using the following format:

Individual entry  
STAV\_SurnameFirstname\_title\_entrycode

Group entry  
STAV\_SurnameFirstname\_SurnameFirstname\_title\_entrycode

\* Do not use apostrophes or special characters

SCIENCE TALENT SEARCH 				
Risk Assessment Form:				
Name of Entry _____				
Student Name: _____		Signature: _____		Date: _____
Student Name: _____		Signature: _____		Date: _____
Your assessment should include sample handling, storage, disposal, spill procedures and use of machinery...				
Type of Risk	Hazard	Level of Risk	Precaution taken to control risk	Source of information
<input checked="" type="checkbox"/> Chemical or microorganism <input type="checkbox"/> Procedure or equipment	Dilute Sodium hydroxide solution (less than 0.05M)	Low risk	May cause harm on contact with eyes or in a cut, wear eye protection and gloves. If contact is made with eyes or on skin, flush immediately with water and follow up with doctor	Teacher and Material Safety Data Sheet
<input type="checkbox"/> Chemical or microorganism <input checked="" type="checkbox"/> Procedure or equipment	Scalpel	Medium risk	May cause severe injury if used inappropriately. Store scalpel where it will not be stolen or used inappropriately	Teacher and <a href="http://www.riskassess.com.au">www.riskassess.com.au</a>
Possible sources of information to complete your risk assessment				
<ul style="list-style-type: none"><li>• <a href="http://www.riskassess.com.au">www.riskassess.com.au</a></li><li>• Search: safety data sheet</li></ul>				

< Sample Risk Assessment Proforma.  
A blank form can be downloaded from the STS website.

All Bursary winners are expected to display their projects on Exhibition and Presentation Day.

Winners in the Games, Models, Inventions, Computers, Experimental Research and Creative Writing sections must bring their entries and other necessary equipment to the Exhibition.

Posters and Photography winning entries will be displayed by the STS Committee. (TBC)

The Presentation of bursary awards and medallions (special gift for your attendance) will take place on Presentation Day at a Presentation ceremony. All bursary winners are expected to be in attendance between 9.00am and 1.30pm to discuss their projects with visitors and to receive their awards.

## The proposed plan for the day is:

---

8.00am – Registration  
9.30am

---

9.30am The Exhibition is opened to invited guests and the Press.  
It is important that prize winners are present to discuss their work with interested people.

---

10.00am The Exhibition will be officially opened, after which families and members of the public are encouraged to look through the Exhibition.  
Then comes the long awaited reward for your efforts this year – the presentation of bursaries and medallions. This is a fitting conclusion for your efforts.

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11.15am – Bursary Ceremony 1  
12.15pm

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12.30pm – Bursary Ceremony 2  
1.30pm

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**Note:** The above plan may change. Bursary winners will be sent a detailed plan for this day when they are notified of their success early in Term 4.

## What happens next?

Having seen how you can benefit from STS, we hope that you will start to plan another entry for 2024. Perhaps you will have gained some new ideas from seeing the work of others and from talking to prize winners from other schools.

### STS Presenters in 2022

*STAV and the STS Committee would like to thank each of the opening speakers and presenters for their contribution to Presentation Day and acknowledge their involvement and commitment to Science Education.*

Dr John Farmer OAM, L & F Eyecare

Dr Lanka Wickramaarachchi, L & F Eyecare

Ms Sheida Shadpour, Global Power Energy

### Special Exhibition and Presentation webpage for 2022:

[www.stav.org.au/science-talent-search/sts-exhibition-and-presentation-2022/](http://www.stav.org.au/science-talent-search/sts-exhibition-and-presentation-2022/)



# SPECIAL THANK YOU

The following organisations are thanked for their donations and contributions to our expenses:

Australian Catholic University

Australian Skeptics –  
In Memory of Martin Hadley

Australian Society for Biochemistry  
and Molecular Biology

Biology Teachers' Network Inc.

Chemistry Education Association

Corporate Prepaid Cards

Deakin University: Faculty of Science,  
Engineering and Built Environment

Don and Robyn Hyatt

Electric Energy Society of Australia Inc.

Entomological Society of Victoria Inc.

Humanists Victoria

In Memory of Eileen Goodfield  
and Dorothy Dalton

Institution of Engineering and Technology

Ken Greatorex

Melbourne Archdiocese Catholic Schools

Methodist Ladies' College

Minerals Council of Australia  
(Victorian Division)

Parade College

Quantum Victoria

Rowe Scientific Pty Ltd

Science Teachers' Association of Victoria Inc.

The Field Naturalists Club of Victoria Inc.

The Walter and Eliza Hall Institute  
of Medical Research

Victoria University

Yakult Pty Ltd.

## Science Victoria Science Teachers Association of Victoria Inc.

PHYSICAL ADDRESS:

5 Munro Street  
Coburg VIC 3058

POSTAL ADDRESS:

PO Box 109  
Coburg 3058

PHONE:

(03) 9385 3999

EMAIL:

[sts@stav.vic.edu.au](mailto:sts@stav.vic.edu.au)

WEBSITES:

[www.stav.org.au](http://www.stav.org.au) and  
[www.sciencevictoria.com.au](http://www.sciencevictoria.com.au)



STAVscience