Teacher & Student

Guidelines and Information Kit

For entries into the 2011 Australian Stockholm Junior Water Prize

Overview

The Stockholm Junior Water Prize (SJWP) is the most prestigious youth award for a water-related science project at the high school level. The prize taps into the unlimited potential of today's youth as they seek to address water challenges.

Created in 1997 by the Stockholm Water Foundation, the prize was established to mirror the adult Stockholm Water Prize. The Stockholm International Water Institute facilitates the international competition.

The Australian Water Association (AWA) organises the Australian competition with support from ITT Water and Wastewater. The Australian SJWP aims to inspire students to develop solutions to real water problems, and can encourage students into careers in the international and Australian water community.

For more information contact the AWA's Project Manager – School and Community Education:

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What is the Stockholm Junior Water Prize?

Australian Stockholm Junior Water Prize (ASJWP)

The Australian Stockholm Junior Water Prize (Australian SJWP) is an annual national water science competition for senior high school students that aims to increase interest in water-related issues and research, and to raise awareness and knowledge of local and global water challenges.

The Australian SJWP is open to projects aimed at improving the quality of life through developing innovative solutions to water problems. Investigations can include water resource management, water protection, and water and waste water treatment.

The winner will be flown to Sydney to accept their award at AWA's Ozwater '12 Conference and Exhibition in May 2012.

The Australian SJWP winner will then go on to represent Australia at the international competition in September 2012 in Stockholm, Sweden.

Stockholm Junior Water Prize

The SJWP is the most prestigious international award for high school students who conduct research projects in water science. This international student science prize enjoys the patronage of HRH Crown Princess Victoria of Sweden.

National winners from over 30 countries travel to Stockholm, Sweden during World Water Week in September to participate in a week long cultural exchange program and compete for the international prize, US$5,000 and a crystal water sculpture.

Task Outline

Students are invited to develop practical and innovative water research projects aimed at improving quality of life and the environment. The scope of the project may be on a local, regional, national or global topic but must have the potential to improve quality of life and/or the environment. All projects must use a research-oriented approach, which means that they must use scientifically accepted methodologies for experimentation, monitoring and reporting results, including statistical analyses.

Steps

Choose a topic to research

This is your chance to investigate something you are passionate about, something that interests you or grab an idea where you think you could make a real change.

Your topic could revolve around a waterway near your school, how you could improve treatment or control flooding. However, it could be international and could be an idea to improve water quality or water resources worldwide. Do a bit of research, the world is your oyster!

Decide on your hypothesis or key question to answer

The hypothesis is an ‘educated guess’, what do you think your results will achieve? What do you want to know? Why is it important that you find this out?

Research relevant background information

This is important in all projects. It is time to discover what has been done, if anything, on this issue. What part of this research can help you undetake your experiments?

Undertake experiments, monitoring and/or further research

An experiment starts and finishes with factors that change during the experiement. These are the variables. This is where you might want to seek assistance from your science teacher to ensure you undertake accurate experiments or monitoring.

Analyse results

Take some time to carefully review all of the data you have collected from your experiment. Use charts and graphs to help you analyse the data and patterns. Did you get the results you had expected? What did you find out from your experiment?

Write a scientific report outlining the research/experiments and a discussion of results and conclusions/ recommendations

This is where it is put all together. Keep reading for more tips on writing the report.

Eligibility & Judging

Eligibility

All Australian school students aged between 14 and 19 years of age can enter the Australian SJWP. Students must be between the ages of 15-20 in September 2021 to compete in the international competition in Sweden.

Individuals and groups of up to three students are eligible to enter.

Judging

A judging panel to assess nominations for the Australian SJWP is established by AWA National Office and consists of between six and nine members of the water industry, including the Chair, generally the AWA Project Manager for School and Community Education.

The judging process is outlined below:

- Review of student papers by nominated judging panel. Scoring is based on the competition criteria
- Selection of three national finalists based on paper entries
- Interviews with the three finalists based on the paper entries
- Selection of national winner based on both paper and interview scores
- Announcement of the Australian SJWP winner at the Ozwater'12 Gala Dinner

Prizes

Participate in the Australian SJWP and you could win some fantastic prizes!

Trophies

- The national winner receives a glass trophy and certificate
- The national winner's school receives a glass trophy and certificate

National Travel

- The winner receives a free flight and accomodation to accept thier trophy at AWA's Ozwater'12 Conference and Exhibition in Sydney during May 2012.

International Travel

- The national winner* receives a trip to Stockholm, Sweden to represent Australian in the • international SJWP and participate in a week long cultural exchange program during September 2012.

** If the national winner is a group project, one representative receives the expense paid trip. Other group members may go to Stockholm at their own expense.*

For the School

- Each school who enters receives a certificate for being committed to the development of water solutions from the Australian Water Association
- The winning school receives a glass trophy and certificate.

Experience

' I entered this competition because whether I won or not, it provided me with an excellent opportunity to develop my skills and knowledge of scientific research.' Australian Stockholm Junior Water Prize Winner 2011

Project Criteria

The project can earn a maximum score of 115 points. A project is judged using six different criteria. A Score from 1 to 5 is assigned (1 being the lowest score). The score for each criterion is then multiplied by the factor assigned to each criterion.

1) Relevance

Relevance of the project both in terms of scientific relevance and overall relevance for both environment and society:

- Does the project target and important challenge within the water environment?
- Is the project scientifically relevant (can the scientific level be related to basic, applied. research and arte the results of direct applicable for implementation)?
- Can the project contribute to the improvement of the quality of life or the environment?
- Is the project proposing innovative solutions to unsolved problems?
- Does the project increase the awareness on water issues?
- Does the project integrate environmental and societal issues?

2) Creative ability

Shows the creativity of the project in relation to:

- How to pose a problem
- How to solve a problem
- Analysing data
- Experiments or investigations
- How to mediate and make the affected parties aware ofthe problem

3) Methology

- Is there a clearly definied idea on which ia result can be achieved?
- Is the problem well defined?
- In what way has it been limited?
- Has the work been planned accordingly?
- Is there adequate information upon which to draw conclusions?
- Have the possible misinterpretations of the data been taken into consideration?
- Are there any new questions or suggestions for continued research?

Project Criteria Continued

4) Subect knowledge

- Is the student familiar with literature and ongoing research in the field?
- Upon what sources has the work been based?
- Is the list of references satisfactory? (Have the references really been studied?)
- To what extent have sources of popular science been consulted?
- Is the author familiar with the topic dealt with in his/her work?
- Is the author knowledgeable of ongoing research in the field? Terminology?
- Is the author familiar with alternative solutions?

5) Practical skills

- Has the student made the exhibit themselves?
- Have they carreid out the measurements etc?
- What help has been provided by parents, teachers, professionals etc.?
- Has advantage been taken of material available in school?
- From where has the equipment been obtained for the exhibit? Was it self-made?
- How well has available techniques been used?

6) Report and presentation

- Can the student present the work in a proper and informative way, both written, verbally and through the exhibit?
- Is the content of the work well structured?
- Is the level of the text, illustrations, diagrams and the language in the written report sufficienct?
- Is the display appealing with regards to any special qualitities and personal touch?
- Is there a relationship between the display and the text material?

Developing a SJWP Paper

The following are recommendations from the SJWP judging panel based on their experience in reviewing projects.

Projects should not only include a problem statement, but clearly explain how the project can contribute to a solution. Even if the project itself may not solve the problem, it should demonstrate how the activities in the project can play a role in a solution.

Each project should try to address a cause-effect solution. This means studying not only the environmental effect (e.g. nitrogen load in a lake system), but also the causes behind the problem and ways of solving the problem. For example, a study on the eutrophication level of a lake in itself will not be highly competitive in the SJWP competition. On the other hand, if the study also addresses the causes behind the environmental disturbance and outlines how eutrophication monitoring will contribute to improved management of the lake environment, then the project will stand a better chance in the competition.

Development-oriented research projects are strongly welcomed. However, it is important when presenting an applied solution to a problem (e.g. the invention of a new technology or a better way of analysing a problem) that the project refers to previous work. Include an explanation of the gaps you are filling that others have not studied before.

If the project focuses on raising awareness and creating a change in the way people manage water, it is important to document the work in a way that gives quantitative evidence to what has been achieved. For example, it is not enough to say that “many people at the project site have started saving water with a new technology”. Instead it is important to show (e.g. through surveys) the number of people that have adopted a new way of managing water in a structured way (e.g. change over time, etc).

If a project is a long-term school project, clearly show what has been done by whom over the years. Show what you or your team of up to three students has contributed to the final consolidated result.

It is important that you clearly show that you were responsible for conducting the research and developing the written the project.

Finally, it is important that you show that you have read relevant literature on the topic for your own understanding and orientation.

Paper Guidelines

These guidelines are designed to help students prepare their paper in a professional format for the Australian Stockholm Junior Water Prize competition. Please follow them as closely as possible.

Unlike other science competitions, the SJWP competition weighs the quality of the research paper much more heavily than the poster presentation. Past international SJWP winners wrote papers that closely followed these guidelines and you may increase your chances of winning by following them, too!

The written project

The written project must meet the following requirements:

- The paper must be written in English.
- The paper must be typed in 12-point Times New Roman, 11/2 spacing and left aligned. Margins should be 2cm on the top and the bottom, 1.5cm on sides.
- Include page numbers for every page except the title page.
- Together with figures, photographs, tables, and annexes, the paper must not exceed 20 pages of A4 size paper, including the preliminary matters.
- The paper must be submitted electronically as a Word document.
- We recommend that the report is divided in accordance with academic writing, and containing information as outlined in the following section.

How to Set Out Your paper

Title Page

Students may design the title page of their report as they wish, but it must contain the following information in an easily legible form: ''Entry to the Stockholm Junior Water Prize 2012', report title, name(s) and country.

Preliminary Matters

This refers to the pages between the title page and the first page of the main report. These should provide the following (and preferably in the order given):

1. Summary of the project – no more than one page
2. Table of contents
3. List of abbreviations and acronyms that are used in the report
4. Acknowledgements. It is important to indicate the extend of the external help received during the projects.

This information must be included in the 20 pages of the written project.

The main report

Introduction
Describes the project in broad detail.

Materials and Methods
Details all experimental procedures used in project.

Results
Presents all results obtained in research.

Discussion
Discusses results

Conclusions
Presents conclusions of research

References
Provides information on work referenced in research paper

Appendices
Details non-standard methods or other information too lengthy for the paper's main body

Detailed Guidance for Your Paper

1) TITLE PAGE

You may design the title page of your paper as you wish, but it must contain the following information in an easily legible format:

- "Entry to the Stockholm Junior Water Prize [year]"
- Paper title
- Your name(s)
- Name of your school

2) PRELIMINARY MATTERS

Preliminary matters refer to the pages between the title page and the first page of your main paper. These pages should include the following items (preferably in the order given):

Summary (No more than one page single-space text)

The summary is a complete and concise summary of the research project and the findings. It should provide an interesting synopsis of the project and use language that appeals to a broad audience. The summary should contain the following:

- a one sentence statement of the objective of the study
- the research methodology used to arrive at the conclusions
- the results observed
- the conclusions of the study (including recommendations and suggestions).

Tips:

- Write a summary that accurately reflects the content of the paper
- Briefly state the problem or purpose
- Indicate the theoretical or experimental plan used
- Summarise the principal findings and point out major conclusions
- If abbreviations are used, define them at first use in the abstract and again at first use in the paper body

Detailed Guidance Continued

Table of Contents

The table of contents should list all of the sections and subsections in the paper.

Abbreviations and Acronyms

This list should contain every abbreviation and acronym used in the paper.

Acknowledgements

The acknowledgements section should be used to list and thank all the people who helped you in your project. It is important to clearly indicate how much external help you received.

3) INTRODUCTION

This section sets out your project in broad details. Describe the water-environment problem you studied and why it was important. Also put your project in its scientific setting, detailing at least the most relevant work done on your project topic by others. We don't expect a very detailed literature review, but we do expect that you understand the scientific context of your project. See References for advice on how to give in-text references to the work of others.

4) MATERIALS AND METHODS

In this section you must detail all of the experimental procedures that you used in your project – all methods and all materials. However, for standard analyses it is not necessary to describe the processes in detail; it is sufficient to give a reference to the methods in a book. If non-standard methods were used, you must describe them in detail. If they are too lengthy, they can be placed in an Appendix at the end of your paper (see Appendices).

5) RESULTS

In this section, you present all of the results you obtained in your research. Present them either as tables or figures, along with an appropriate description, but do not present the same information in both table and figure format. Choose whichever of these formats you think is most suitable for the particular set of results you are presenting. Of course, if you do analysis of your results, you can present the results of this analysis in a separate table or figure.

Detailed Guidance Continued

6) DISCUSSION

Note: This is an extremely important section which the judges pay close attention to, so think about it very carefully.

Here you must discuss your results. You may wish to include the more important analyses of your results in this section (rather than in results section). You must discuss how the results are important to the water environment problem you were studying, how novel they are, and how they relate to the results of others working on a similar project (are they the same, similar, or different? why?).

You should also discuss your results in the wider scientific and/or social context, for example, are your results useful to local or national government agencies? Are they relevant to local people? Explain your answers. How does your project contribute to improving the quality of life and/or the environment? Of course, if your project is completely novel, then you may not be able to discuss your results in relation to the results of others. In such a case, you must discuss your results in the wider scientific and/or social context only.

7) CONCLUSIONS

We recommend that you number your conclusions and present them on a maximum of two pages (one page is perfectly acceptable). Your conclusions should be short and to-the-point. As a guide, each conclusion should be no more than 1–3 short sentences long. Please remember that this section is for your conclusions and only your conclusions. It is not the place to discuss your results.

8) REFERENCES

The purpose of providing a reference is to enable interested parties to obtain and read the reference, so you must provide all the information necessary for this. If you are familiar with the Harvard System, then you may use it. Otherwise, we recommend you use this simpler method:

In the text, give references as numbers in square brackets.

For example:

“Smith [1] found that …, but other workers have found the opposite [2, 3].”

“We used the acid-dichromate method to measure the wastewater COD [4] and the membrane-filtration technique with lauryl sulphate broth and overnight incubation at 44 to count the number of faecal coliform bacteria in both the wastewater and the river [5].”

Detailed Guidance Continued

Immediately after the conclusions section you must list in detail all the in-text references you have made. The list is numerical, using the numbers you used in the text. So, in the above example, the first reference is to Smith. How you present this reference depends on whether it is a book, a paper in a scientific journal, a chapter in a book, or a newspaper report.

a. Book:

Surname, Initials (Year) Title of Book. Publisher's Name, City and Country (or State if the USA) of publication.

b. Journal or Paper:

Surname, Initials (Year). Paper Title. Full Name of Journal Volume Number, First and Last Page Numbers of the Paper.

c. Book Chapter:

Surname, Initials (Year). Title of chapter, In Title of book (ed. [= edited by] Initials and Name of all the editors), first and last page numbers of the chapter. Publisher's name, City and Country/State of publication.

d. Newspaper or Magazine Report:

[1] "Our rivers are polluted", Daily Express (London, England), 5 June 2003, p. 6.

e. Non-English References:

If the language of the reference uses the Latin alphabet, give the title in the original language followed by a translation in English in square brackets – for example:

[5] Poincaré, JP (2001). Le Lagunage Naturel [Waste Stabilization Ponds]. Editions Eau, Paris.

Detailed Guidance Continued

For other alphabets, simply give the translation in English with the original language given at the very end in round brackets – for example:

[11] Chinese Academy of Engineering (2002). Design Manual for Wastewater Treatment. Chinese Academy of Engineering, Beijing (in Chinese).

f. More than one author use: [1] Smith, AB, Jones, CD and Bull, EF (1996).

g. When referencing a Web site, include the author (if any), title of the site, URL, date accessed, and any other identifying information.

Library of Congress Home Page. http://lcweb.loc.gov (accessed Dec 2005).

10) APPENDICES

Use appendices only if necessary, for example, to detail non-standard methods of analysis or to give detailed results if you have only summarised them in the Discussion section. Appendices are used to give detail that would otherwise make the main text too lengthy or cumbersome. You should number your appendices in order, as follows:

Appendix I. Method used for the determination of chlorophyll a

Appendix II. Detailed results of in-river chlorophyll a measurements

If there is anything in these guidelines that you do not fully understand, ask your teacher or project supervisor for help. This research paper could easily be considered university level work, so don't be afraid to ask!

Project Ideas

The following is a list of projects submitted for the National and International Stockholm Junior Water Prize in the past. It is suggested that you choose a topic which is nationally relevant and topical, which provides an opportunity to investigate opportunities for improving quality of life and/or environment through innovative approaches.

- Design and Optimisation of a Portable Low-Cost Distillation Modular Unit (R Roy, S Koh and C Wang – Singapore).
- Does the River Continuum Concept Work in Small Rivers that begin from Swamps? (N Nuutinen and T Pippuri – Finland).
- E-Light-Minating the Thirst – Improving a Solar Water Disinfection Method Using a Physical Approach (J Cote and A Litalien – Canada).
- Firewood Hearth Distiller for Safe Drinking Water for Vulnerable Rural Population (R Siriwardana, S Dissanayaka and A Silva – Sri Lanka).
- Fruit Peel Recycling – Application of Fruit Biopolymers for Heavy Metal Ions and Radio Nuclides Extraction from Waste Systems (T Kirpicheva, M Rodjkin and A Sancevich – Belarus).
- How Water Resources can be Managed and Protected through Public Education – A Case of the Zenu Community in Ghana (I Barnes – Ghana).
- Modelling the Toxic Effects of Silver Nanoparticles under Varying Environmental Conditions (J Chai – USA).
- Multi-tiered Wetlands – A New Technique for Improving the Efficiency of Artificial Wetlands (A Stewart - Australia)
- Restoration of Water Reservoirs using Latent Phases of Aquatic Organisms (A Shinkarev – Russian Federation).
- Water Treatment with Free-floating Aquatic Plants (N Wijemunige – Australia)

Important Information

Closing Date

Entries for the 2012 competitions close **30 November 2011**

How to enter

To enter, complete your project accoroding to the Australian SJWP Criteria and project guidelines, then follow the steps below:

1. Download and complete entry form at www.awa.asn.au/sjwp
2. Submit entries via email to Project Manager – Community and School Education, Fleur Johnson at fjohnson@awa.asn.au with 'ASJWP' in the subject heading. Include as attatchments:
    - Your project in Word format
    - Your completed entry form
    - Biography
    - Photo
    - Abstract or summary

Important Dates

30 November 2011	2012 Australain SJWP entries close
30 March 2012	Judging completed and finalist notified
9 May 2012	Winner presented with award at Ozwater'12 in Sydney
August 2012	2012 Australian SJWP entries open
September 2012	2012 SJWP Ceremony held during World Water Week in Stockholm

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With assets of more than $9 billion and more than 1500 staff, SA Water is a big part of the South Australian landscape and can trace their history back to 1856.

www.sawater.com.au

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Allconnex Water is the water and wastewater business for the Gold Coast, Logan and Redland districts.

Established in 2010 under the State Government's South East Queensland (SEQ) Water Reform. The reform was initiated to improve the delivery of water services in SEQ and to make this rapidly growing region drought resilient.

The Gold Coast, Logan and Redland councils own the business. Our earnings are therefore invested back into these districts through the three councils.

Managing water and wastewater is the single focus of Allconnex and they provide more than 900,000 consumers with safe, reliable and high quality water services.

www.allconnex.com.au