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Teacher & Student Guidelines and Information Kit

For entries into the 2011 Australian
Stockholm Junior Water Prize



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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 our 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 is a highly visible initiative that demonstrates AWA's commitment to promoting water environment research and careers, and it raises the Association's profile as a leader in the international water and wastewater community.

Form more information contact the Australian Stockholm Junior Water Prize National Organiser:

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SJWP

What is the SJWP?

Australian Stockholm Junior Water Prize

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 improvement of water quality, water resources management, water protection and water and wastewater treatment.

Three finalists will be selected to compete for the national prize at the Australian SJWP Ceremony held at AWA's Ozwater Conference and Exhibition in May 2011.

The Australian SJWP winner will then go on to represent Australia at the international competition in September 2011 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 each year to participate in a week long cultural exchange program and compete for the international prize, US\$5,000 and a crystal water sculpture.

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Task Outline

Task

Students are invited to undertake a water-related research project focusing on solving community water problems.

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.

Research should be written up into a 15-page scientific paper and submitted to the National Organiser.

Steps

- Choose a topic to research.
- Decide on your hypothesis or key question to answer.
- Research relevant background information.
- Undertake experiments, monitoring and/or further research.
- Analyse results.
- Write a scientific report outlining the research/experiments and a discussion of results and conclusions/recommendations.

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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 2011 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 three and five members of the water industry, including the Chair, generally the AWA Community Education Coordinator.

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
- Oral presentation of project by three national finalists in front of nominated judging panel
- Selection of national winner based on both paper and presentation scores
- Announcement of the Australian SJWP winner at the Ozwater'11 Gala Dinner

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Prizes

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

Trophies

- National winner receives a glass trophy and certificate
- National winner's school receives a glass trophy and certificate

National Travel

- Up to three national finalists will receive a free flight and accommodation to present their projects to the Australian SJWP judging panel - held during AWA's Ozwater'11 Conference and Exhibition in Adelaide during May 2011

International Travel

- The national winner* receives an expense paid trip to Stockholm, Sweden to represent Australian in the international SJWP and participate in a week long cultural exchange program during September 2011.

* 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.

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Project Criteria

1. Relevance

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

- Does the project target an important challenge within the water environment?
- Is the project scientifically relevant (can the scientific level be related to basic, applied research and are the results directly applicable for implementation)?
- Can the project contribute to the improvement of the quality of life or quality of 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 of the problem

3. Methodology

- Is there a clearly defined idea on which a result can be achieved?
- Is the problem well defined?
- In what way has the problem 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?

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Project Criteria continued

4. Subject 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 consulted?)
- 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

- Have the students the student made the exhibit by him/herself?
- Has he/she carried out the measurements, etc?
- What help had been provided by parents, teachers, professionals, etc?
- Has advantage been taken of material available in school?
- Where has the equipment for the exhibit been obtained? Was it self-made?
- How well have available techniques been used?

6. Report and Presentation

- Can the student present the work in a proper and informative way, both 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 sufficient?
- Is the display appealing with any special qualities and personal touch?
- Does the display show any special qualities?
- Is there a relationship between the display and text material?



Developing a SJWP Paper

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.

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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. If your research would be better presented in a slightly different format, you may vary your presentation; however, we urge you to use the following guidelines.

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!

Paper Format

The paper must be written in English.

The paper must be typed in 12-point Times New Roman and left aligned using 1.5 spacing and the following margins: 2cm on the top and the bottom, 1.5cm on sides.

Together with figures, photographs, tables, and annexes, the paper must not exceed 15 pages of single-sided A4 size paper.

All pages, except the title page, must be numbered at the bottom center. The Title Page is not included in the 15 page limit.

The paper must be submitted electronically as a PDF or Word document.

We recommend that the report is divided in accordance with academic writing, and containing information as outlined in the following section.

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How to Set Out Your paper

Paper Sections and Numbering

Title Page: This is the cover page of the paper and should include the following information: "Entry into the Stockholm Junior Water Prize (Year)"; Report Title, Name, and School. This page is not numbered.

Preliminary Matters: This refers to the pages between the title page and the beginning of a research report. Page numbering begins in this section.

- I. **Abstract:** Concise summary of your research project and findings. (No more than 180 words.)
- II. **Table of Contents:** List of sections in a research paper by page number.
- III. **Key Words:** List of words or short phrases that research focuses on.
- IV. **Abbreviations and Acronyms:** List of abbreviations and acronyms used in the paper.
- V. **Acknowledgements:** Acknowledgement of those who assisted in research. It is important to indicate the extent of external help received during the projects.
- VI. **Biography:** Information about the author.

Paper Body: This is the main body of a research paper.

1. **Introduction:** Describes project in broad detail.
2. **Materials and Methods:** Details all experimental procedures used in project.
3. **Results:** Presents all results obtained in research.
4. **Discussion:** Discusses results.
5. **Conclusions:** Presents conclusions of research.
6. **References:** Provides information on work referenced in research paper.
7. **Bibliography (if necessary):** Provides information on sources of information that were consulted generally, but not specifically referenced.
8. **Appendices (if necessary):** 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 refers 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):

a. Abstract (No more than 180 words.)

The abstract 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 abstract 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 for a Good Abstract:

- Write the abstract last so that it accurately reflects the content of the paper.
- Briefly state the problem or purpose.
- Indicate the theoretical or experimental plan used.
- Summarize 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.

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Detailed Guidance continued

b. Table of Contents

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

c. Key Words

This list should contain words or short phrases that capture the main topics of your research. They are used to help individuals locate information on specific research areas, such as through a web search.

d. Abbreviations and Acronyms

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

e. 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.

f. Short Biography (No more than half a page.)

The biography should include information about you, including what your interests are, what you want to study, etc.

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.)

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Detailed Guidance continued

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.

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. 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.

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Detailed Guidance continued

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 (all discussion belongs in Discussion).

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 fecal coliform bacteria in both the wastewater and the river [5].”

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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).

9. BIBLIOGRAPHY

In addition to the list of specific references, you may (if necessary) give a list of books and other sources of information that you consulted generally but have not provided as in-text references. This list is termed Bibliography, and it follows immediately after References. The items in your Bibliography list are referenced in the same way as described above.

Remember to give all the information necessary to enable someone else to obtain the references you quote in your paper.

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Detailed Guidance continued

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!

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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).
- Restoring the Natural Cycle of Nutrients (A Rengstedt – Sweden).
- The Identification of Critical Salinity Thresholds for Upper Estuarine Plants (Robbie Bishop-Taylor – Australia)
- The Sustainability of the Brisbane River for Recreation and Commercial Use (L Van and A De Sousa – Australia)
- Water Filtration Utilising Sea Shells (D Klippel-Cooper and G Klippel-Cooper – Australia).
- Water Treatment with Free-floating Aquatic Plants (N Wijemunige – Australia)

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Important Information

Closing Date

Entries for the 2011 competition close 10 December 2010

How to Enter

To enter, complete your project according to the Australian SJWP Criteria and Project Format Guidelines, then follow the steps below:

1. Download and complete the 2011 entry form at www.awa.asn.au/sjwp
2. Send an email to awards@awa.asn.au with 'SJWP entry' in the subject heading. Include as attachments:
 - Your project in Word or PDF format (which adheres to the guidelines provided)
 - Your completed entry form
 - Biography (please include a short biography for each student - minimum 180 words, maximum 250 words)
 - Photo (photo of each student either individually, or as a group - in jpg or similar format)
 - Abstract (minimum 250 words, maximum 350 words)

Important Dates

10 Dec 2010	2011 Australian SJWP entries close
Feb 2011	Judging completed and finalists notified
May 2011	2011 Australian SJWP Cenermony at Ozwater'11 in Adelaide
Jul 2011	Winning Australian SJWP project submitted to international competition
Aug 2011	2012 Australian SJWP entries open
Sept 2011	2011 SJWP Ceremony held during World Water Week in Stockholm

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