

Regulations of the New Zealand Young Scientists' Tournament

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Chapter 1. General information

I. International Young Naturalists' Tournament

The International Young Naturalists' Tournament (hereinafter the IYNT) is an annual international team competition for school students testing their ability to solve research problems of natural sciences, convincingly present their solutions, and defend them in scientific discussions called Science Fights (hereinafter SF.)

New Zealand Young Scientists' Tournament (hereinafter the NZYST) is the official qualification tournament for New Zealand students and is open to all secondary school students aged under 17 throughout the year of competition.

II. The participants of the New Zealand Young Scientists' Tournament

1. Age limit

1. The participants are aged 12 through 16. The age limit is set such that participants of the NZYST must not turn the age of 17 years during the calendar year of the respective NZYST competition.

2. School teams

Any school in New Zealand is able to request entry into NZYST prior to the published deadline. An invited school is usually represented by one team but an application can be made to enter a second team. In cases where a school does not have enough suitable students, a maximum of two schools may combine to form a team. A small entry fee will be charged.

3. The membership of the teams

An NZYST team is composed of three Team Members, including one Team Captain. The Captain is the official representative of the Team during the NZYST. No Team Member and no Captain can be replaced during the competition.

4. Team Leaders

The team is accompanied by a teacher who is the team leader. All teams must supply at least one teacher to act as a juror.

5. Late entries etc.

The decision about the participation of such a team is taken by the National Organising Committee(NOC).

III. The agenda of New Zealand Young Scientists' Tournament

The IYNT New Zealand competition is carried out in a period determined by the NOC (late March).

All teams participate in three Selective SFs over 2 days. The top three teams will also compete in a Grand Final on the second day.

IV. Problems

The problems of the IYNT are formulated by the General Council of IYNT and published at the IYNT closing ceremony for the following year. The NOC will select seven of these problems to be used in the qualification competition NZYST.

1. **Main problems** are research oriented experimental and theoretical problems in natural sciences released by the NOC to the Teams and the general public in advance but not earlier than on the closing day of the previous IYNT.
2. **Additional problems** of the NZYST are not published in advance and are released to the Teams by the NOC directly in the course of the NZYST. These problems are research oriented and are solved by the Teams during the respective SF.

V. Science Fights

A Science Fight (SF) is a meeting of three or two Teams in which the Teams discuss and present their solutions to the NZYST problems. There are three types of SFs in the NZYST which differ in the type of problems, in the agenda, and in the eligibility of Teams to participate.

1. **Selective SFs with main problems** are conducted according to the Standard SF regulations and use the main NZYST problems known to the Teams in advance. All Teams participate.
2. **Selective SF with additional problems** is conducted according to the Standard SF regulations with changes in the preparation time and challenge procedure. This SF uses the additional problems released to the Teams by the NOC immediately before the SF. All Teams participate.
3. **Grand Final SF** is conducted according to the Standard SF regulations with an omitted challenge procedure. Main NZYST problems are used. Only appropriately determined winners of the selective SF participate.

VI. Jury

1. In all SFs, the Jury evaluates the solutions of the NZYST problems presented by the Teams and the Team performances by publicly showing integer Grades. The grading reflects whether a Team is successful in their performance. Guidelines and particular criteria aimed at improved grading are made public by the NOC. Each individual Juror decides on each Grade and bears sole responsibility over the Grade. Each Grade is public. No Grade can be corrected retroactively. Each Juror must publicly justify any of their Grades upon the request of Team Captains or the Chairperson.
2. The Jury is nominated and organized by the NOC. It consists of members from universities, science related industries and schools. The Team Leader from each team is included in the Jury (unless the school has supplied additional jury members). Where possible Team Leaders should not be judging their own team and should not grade the same team more than twice.

3. One of the Jurors in each Group is the Chairperson who conducts the SF and ensures that the Regulations are respected. The Chairperson is appointed by the NOC or by an accredited Committee before the beginning of the SF.

VII. Introduction of Teams at the Opening Ceremony

Each Team introduces themselves in a short artistic performance during the Opening Ceremony. The performance can be of any genre. Team Leaders may participate. The Teams can in particular produce and display a short video about them. The duration of the Introduction is limited to 3 minutes. Exceeding this time limit incurs a penalty. By the end of the NZYST, the Teams submit any audiovisual materials of their Introduction (e.g. videos or slides) to the NOC for archiving, and must ensure that the files are safely kept.

Chapter 2. Science Fights

I. Standard Science Fight regulations

1. Each SF in each Group is conducted by the Chairperson who facilitates discussions, announces the ordering, manages time, clarifies the Regulations, and ensures their implementation. In the beginning of a SF, the Chairperson asks Jurors to introduce themselves, and asks Team Captains to introduce their Team Members. At the SFs from the Selective SF 3 onwards, the Chairperson carries out the Captain's Contest in the beginning of the SF.
2. Two or three teams participate in a SF, depending on the total number of teams. In each stage a team plays one of the two roles: Reporter and Opponent (Observer). In the subsequent Stages of the SF, the teams change their roles according to the schemes:

| <i>Two teams SF</i> | | | <i>Three teams SF</i> | | | |
|---------------------|-----|-----|-----------------------|---------|---------|---------|
| Stage | 1 | 2 | Stage | 1 | 2 | 3 |
| Team 1 | Rep | Opp | team 1 | Rep | Obs/Rev | Opp |
| Team 2 | Opp | Rep | team 2 | Opp | Rep | Obs/Rev |
| | | | team 3 | Obs/Rev | Opp | Rep |

3. In the first two Selective SFs, the sequence of performances is determined by the Tournament Bracket established at the Opening Ceremony. In the Selective SF 3 and in the Grand Final, the sequence of performances is determined via Captain's Contest conducted by the Chairperson in the beginning of the SF before Stage I. The Captain's Contest has a sole winner. The winner determines the roles of all Teams in Stage I and thus the sequence of performances in the whole SF. The Captain does not interact with their Team during the Captain's Contest and when deciding on the sequence of performances.
4. Only one Team Member takes to the floor as Reporter, Opponent on behalf of their Teams. All other Team Members may work as assistants, offer technical support to the presenter, pass handwritten notes and, if allowed by the Chairperson, make short remarks.
5. In the course of one Stage, Members of one Team communicate only with each other. They have no right to use mobile data transfer and other technical means to communicate with anyone outside their Team, in particular Team Leaders.
6. Prior to announcing their Grades, Jurors have no right to express their judgment or opinion. Jurors have no right to explicitly examine textbook knowledge of Team Members or pose the same question to several Teams at once.

7. Before the Jurors show their Grades, the Chairperson checks that each Juror has filled and signed their individual protocol and has clearly recorded their Grades. In case of any discrepancy between the protocol and the displayed Grade, the protocol is considered correct.

8. Chairperson and Team Captains can ask any Juror to justify any of their Grades, in particular the extreme Grades.

9. If a Team does not show up for a SF, the Chairperson reports to the NOC. The NOC establishes the whereabouts of the Team and may resolve to conduct the SF without the absent Team as a two-team SF. If the Group in question is planned as a two-team SF, the NOC may introduce a one-time amendment in the distribution of Teams, upon the discretion of the NOC.

II. Standard Stage regulations

1. Each SF is composed of three or two Stages. Each Stage is composed of separate Phases according to the agenda in the table below. Asterisk (*) denotes the positions where Standard Stage regulations should be amended for particular types of SFs.

| # Phase | Duration |
|---|-------------------|
| 1* Challenge by the Opponent | 1 min |
| 2* Accepting or rejecting the challenge by the Reporter | 1 min |
| 3** Preparation of the Reporter | 3 min |
| 4 Presentation of the report | 8 min |
| 5 Clarifying questions of the Opponent to the Reporter | 3 min |
| 6 Preparation of the Opponent | 3 min |
| 7 Statement by the Opponent | 4 min |
| 8 Discussion between the Opponent and the Reporter | 5 min |
| 9*** Clarifying questions of the Reviewer to the Reporter and the Opponent | 2 min |
| 10*** Preparation of the Reviewer | 2 min |
| 11*** Statement by the Reviewer | 3 min |
| 9 Concluding remarks of the Opponent | 1 min |
| 10 Concluding remarks of the Reporter | 1 min |
| 11 Clarifying questions of the Jury to all speakers | 5 min |
| 12 Grading | 4 min |
| 13 Concluding remarks of the Jury, justification of Grades | 4 min |
| 14 Break | 10 min |
| Total for one Stage (no break incl., appx.) | 43 min |
| Total for a three-team SF with 2 breaks (appx.) | 2 h 30 min |
| Total for a two-team SF with 1 break (appx.) | 1 h 40 min |
| Total for the Grand Final with 2 breaks | 2 h 44 min |

* In the Selective SF with additional problems, consecutive challenges by all Teams are carried out in the beginning of the SF. The order of challenges is determined by Captain's Contest. In the Semi-Finals and Finals, the challenge procedure is omitted.

** In the Selective SF with additional problems, the preparation time is used by all Teams for solving an accepted problem. The preparation time is 45 minutes.

*** The Reviewer role will be omitted during Selective SF, but will be included in the final.

2. The Chairperson must rigorously keep the time limits for each Phase.

III. Team roles in the Stage

1. **The Reporter** presents an original solution prepared by their Team. The Report contains the basic ideas and methods for the solution, the description of observations and experiments, theoretical analysis, and also clear conclusions. The Reporter must explicitly cite the sources of any ideas, data or theories which are not of own work.

The standard visual aids for the report are multimedia slides with graphs, figures, data, mathematical expressions, photos, or videos. Other visual aids may include experimental demonstrations or handout sheets.

2. **The Opponent** presents a critique of the Report, including its contents and form, and leads the discussion with the Reporter. The Opponent justifies their agreement or disagreement with the methods, results, and conclusions presented by the Reporter. The Opponent challenges each aspect of the Report and discusses possible improvements. The Opponent points to inaccuracies and errors in the understanding of the problem and in the solution, but also points to achievements and strong sides of the Report. Whilst the Opposition must focus on the Report only and may not be a presentation of their own solution, the Opponent can cite literature and own results to justify particular criticisms.

3. **The Reviewer (Grand Final only)** summarizes and assesses the outcome of the debate between the Reporter and the Opponent, and draws weighted and independent conclusions. The Reviewer presents a short evaluation of the performances of two other teams, pointing to their strong sides and shortcomings. As the Reviewer does not select the reviewed problem, he or she thus expresses their critical third-party view on the essential points raised in the debate and concludes this debate. Whilst the Review must focus on the performance of two other Teams only and may not be a presentation of another solution, the Reviewer can cite literature and own results to justify particular opinions.

IV. Limitations on Team Members to take the floor

1. During any single SF any Team Member may take the floor only once.
2. Throughout all SFs taken together except for the Grand Final, no Team Member may take the floor as Reporter more than twice.
3. In the Final SF, there are no limitations related to earlier performances of individual Team Members. Any of them can however take the floor only once.
4. Penalties are applied if these limitations are not respected.

V. Rules of challenge and rejection

1. In any SF the Opponent can challenge the Reporter on any problem, except for those problems that:
 - a. have been presented in this SF by another team;
 - b. the Reporter has previously reported (in any earlier SF);
 - c. the Opponent has previously opposed;
 - d. the Opponent has previously reported.
 - e. The Reporter has previously opposed
2. The Reporter can reject the challenge. Such a rejection is recorded in the protocol. In such case, the Opponent makes a new challenge.
3. It is allowed for the Opponent to make a new challenge on a problem that has been previously rejected by the Reporter. If the Reporter rejects, this is not counted as a new rejected challenge.
4. In a situation that no problems are left for a challenge, the restrictions are lifted in the following order: first e., then d., then c., then b., then a.
5. Throughout all SFs, the total allowed number of rejected challenges not incurring a penalty is two.
6. Penalties are applied to the Reporter for rejecting a challenge if the Reporter has exceeded the allowed number of rejected challenges.

Chapter 3. Grading, Penalties and Results

I. Grading parameters

1. Grade (G)

Each Juror evaluates the Team performance by giving integer Grades G. In any SF, the Grades are in the following range:

- To the Reporter in a SF from 1 to 30;
- To the Opponent from 1 to 20;
- To the Reviewer from 1 to 10 (Grand Final only)

2. Average Point (P)

The Average Point for any performance is calculated in the following manner. Two extreme Grades, one maximum and one minimum, are replaced with one grade equal to their arithmetic mean. In the next step, the Average Point P is determined as the arithmetic mean of the new data set of $n-1$ grades. Any Average Point is rounded to the nearest 0.1 of a point.

3. The Sum of Points (SF)

The Sum of Points (SF) in a SF is equal to the arithmetic sum of all Average Points for the Team in all performances in the said SF, with any penalties applied. Any resulting SP is rounded to the nearest 0.1 of a point.

4. Total Sum of Points (TSP)

The value of TSP is equal to the sum of all SPs earned by the Team in all completed SFs. The resulting value is calculated after each SF.

5. Rank (R)

The Rank R for a Team has integer values from 1 to N, where N is total number of Teams in the IYNT. It indicates the placing of a Team in the list of all Teams sorted descending. The value of R for each of N Teams is calculated after each completed Selective SF. The top Rank (R=1) is assigned to the Team that has the highest Total Sum of Points (TSP) after all preceding rounds. Rank R is the only criterion to determine Teams that participate in the Grand Final.

II. Penalties

1. Yellow Cards and Summing of the penalties

Penalties during a SF are applied only to the SP earned during the said SF. A Yellow Card is used to indicate each penalty. A Yellow Card issued to a Team reduces the SP in this SF by 10%; two Yellow Cards issued to a Team during a SF reduce the SP by 20%; three Yellow Cards reduce the SP by 30%, etc. The penalties for various violations are applied independently and sum up.

2. Number of rejected challenges (NR)

If the total number of rejected challenges in all (the current and all preceding) SFs exceeds the limit by one, a Yellow Card is issued; if it exceeds the limit by two, two Yellow Cards are issued, etc. If there is no rejected challenge in a particular SF, the SP in this SF is not penalized even if the total number of rejections in preceding SFs has exceeded the limit. Repeated rejection (if a challenge on the same problem has been rejected by the Reporter previously) is not counted as a new rejection.

3. Number of individual performances in one Science Fight (NP)

Any individual Team Member is allowed to take the floor only once during a SF. If a Team Member takes the floor in two roles, one Yellow Card is issued.

4. Total number of individual performances in Selective Science Fights (NT)

Throughout all SFs taken together, except for the Grand Final, any individual Team Member is allowed to be

Reporter only twice. Each violation results in one Yellow Card.

5. Duration of one performance (DP)

If the duration of Team performance during their Introduction at the Opening Ceremony exceeds the time limit (3 minutes), each extra minute results in one Yellow Card. The extra time is rounded up to next minute. There are no penalties for exceeding the time allowed for presentations in the SFs where time is under control of the Chairperson who must stop the Phase when the time is up.

III. Results

The following values of grading parameters for the Teams (with penalties applied) are published as a table after each SF:

R, Rank;

TSP, Total Sum of Points;

SP, Sum of Points for the most recent completed SF or all preceding SFs.

Chapter 4. Tournament Brackets

I. Selective Science Fights

1. For the three first Selective SFs, the Tournament Bracket established at the Opening Ceremony determines what Team competes in what Group and the sequence of performances in each Group.

The Tournament Bracket is established according to an exact procedure made public by the NOC during the Opening Ceremony. The procedure involves drawing lots and aims at such a distribution of Teams among the Groups that the following criteria are respected when possible:

- no two Teams meet more than once.
- no Team competes in any Group more than once.

Below is given an exemplary Tournament Bracket of N=15 Teams, where the numbers indicate the Team index established by drawing lots. If N is a multiple of 3, the respective Bracket is established analogously. If N is not a multiple of 3, an analogous Bracket is established for the nearest next multiple of 3 (N+1 or N+2), followed by removing the extra entries. This and similar Tournament Brackets must allow each Team to be Reporters in all three possible Stages: Stage I, Stage II, and Stage III. The order of Teams in each Group determines the sequence of performances in Stage I.

| SF | Selective SF Groups | | | | | | | | | | | | |
|------|---------------------|----|----|----|----|----|----|----|----|----|----|----|----|
| | A | | | B | | | C | | | D | | | E |
| SF 1 | 1 | 6 | 11 | 2 | 7 | 12 | 3 | 8 | 13 | 4 | 9 | 14 | 5 |
| SF 2 | 10 | 14 | 3 | 6 | 15 | 4 | 7 | 11 | 5 | 8 | 12 | 1 | 9 |
| SF 3 | 12 | 5 | 9 | 13 | 1 | 10 | 14 | 2 | 6 | 15 | 3 | 7 | 11 |
| | | | | | | | | | | | | | 4 |
| | | | | | | | | | | | | | 8 |

II. Grand Final Science Fight

- Three appropriately determined Teams take part in the Grand Final SF. The sequence of performances in the Grand Final Group is determined by Captain's Contest.
- Immediately after the announcement of the three Grand Finalists, the Grand Finalists select the problems for their reports from the set of main NZYST problems. Teams may not select the problem that they have reported in any preceding SF. All problems must be different, and the priority in the choice is determined by the Rank R after Selective SF 3. The list of selected problems is made public.

Chapter 5. Winners

I. Diplomas and Medals

1. Each Team Member and each Team Leader of the winning Teams receive their own Medal and their own Diploma. Official Diplomas of the NZYST must be signed by at least two Members of the NOC.
2. One Team with the highest SP in the Grand Final SF are awarded 1st Place Diplomas and Gold Medals.
3. One Team are awarded 2nd Place Diplomas and Silver Medals of the NZYST .
4. One Team are awarded 3rd Place Diplomas and Bronze Medals of the NZYST .

II. Certificates

All other Team Members and Team Leaders receive Certificates of Participation for their Teams.

III. Final Ranking

The Final Rank (RF) for each Team is made public after the Grand Final and has integer values from 1 to N, where N is total number of Teams in the NZYST . Final Rank RF is used to indicate the placing of a Team after the completion of the NZYST and the order in which Certificates and Diplomas are awarded at the Closing Ceremony, from bottom to top.

IV. IYNT New Zealand squad selection

The Selection Committee chooses up to ten students which includes the three students from the winning team as the New Zealand squad for IYNT. Any student who has participated in NZYST is eligible for selection in the New Zealand squad for IYNT. The squad members are each allocated a different IYNT problem to solve and present to the selection committee approximately two weeks later. The Selection Committee chooses the five students to represent New Zealand in the IYNT that year from these solutions.

The Team Leader of the team winning the NZYST is invited to attend IYNT as a Team Leader of the New Zealand team, provided some of their team is selected for the New Zealand team. Other team leaders are offered a place as a Team leader of the New Zealand team in order determined by the number of members in the New Zealand team and the placing of their team in the Grand Final. These other team leaders will be chosen at the discretion of the NOC.

Any Team Leaders or Jurors accompanying the New Zealand team to IYNT must take part in and facilitate team training.

Chapter 6. Status of the Regulations

I. Authority, Authorship and Application

The Regulations were adapted by Murray Chisholm from the IYNT Regulations developed by Evgeny Yunosov, with contributions by Ilya Martchenko.

II. Effective date

These Regulations are adopted and take effect on August 15th , 2018.

III. Future amendments

These Regulations are adopted and approved by the NOC and can be amended or edited only by the NOC. Unless a future NOC decision abrogates these Regulations, they remain in force indefinitely.