

The Regulations of the International Young Physicists' Tournament

I. The International Young Physicists' Tournament (IYPT)

is a competition among teams of secondary school students in their ability to solve complicated scientific problems, to present solutions to these problems in a convincing form and to defend them in scientific discussions, so called Physics Fights (PF).

II. The problems of the IYPT

The problems are formulated by the International Organizing Committee (IOC) and sent to the participating countries not later than in October. These problems may be used in regional and national tournaments. To compose the problems a meeting of the IOC may be held in the host country.

III. The participants of the IYPT

1. *The national teams*

Any invited country is represented by one team. The host country may be represented by two teams.

2. *The teams of regions, towns, colleges etc.*

The decision about the participation of such a team is taken by the Local Organizing Committee (LOC).

3. *The membership of the teams*

The IYPT team is composed of five high school students. The high school graduates participate in the IYPT in the year of their graduation. The participation of university students is not allowed. The International Organizing Committee may allow participation of teams of four or three students. The composition of the team cannot be changed during the Tournament. The team is headed by a captain who is the official representative of the team during the PF.

4. The team is accompanied by two team leaders.

IV. The Jury

The Jury is nominated and organized by the LOC. It consists of members of different countries. Team leaders (one from each team) are included in the Jury. The team leaders cannot be members of the Jury in the PF where their teams participate.

V. The agenda of the IYPT

The IYPT is carried out in a period determined by the LOC (from May till July) during seven to nine days.

The teams participate in scientific discussions, so called Physics Fights (PF):

- 3 Selective PFs
- Semifinal PF
- Final PF.

The host country provides a cultural program for the participants.

VI. The Physics Fight regulations

Three or four teams participate in a PF (depending on the total number of teams). In the course of a PF the members of a team communicate only with each other.

Before the beginning of a PF, the Jury and the teams are introduced.

The PF is carried out in three (or four) Stages. In each Stage, a team plays one of the three (four) roles: Reporter, Opponent, Reviewer (Observer). In the following Stages of the PF, the teams change their roles according to the scheme:

<i>Three teams PF</i>				
Team	Stage	1	2	3
1		Rep	Rev	Opp
2		Opp	Rep	Rev
3		Rev	Opp	Rep

<i>Four teams PF</i>					
Team	Stage	1	2	3	4
1		Rep	Obs	Rev	Opp
2		Opp	Rep	Obs	Rev
3		Rev	Opp	Rep	Obs
4		Obs	Rev	Opp	Rep

VII. The Stage regulations

The performance order in the Stage of a Selective or Semifinal PF:

	English	English/ Russian
The Opponent challenges the Reporter for the problem	1 min	1 min
The Reporter accepts or rejects the challenge	1 min	1 min
Preparation of the Reporter	5 min	5 min
Presentation of the report	12 min	12 min
Questions of the Opponent to the Reporter and answers of the Reporter	2 min	3 min
Preparation of the Opponent	3 min	3 min
The Opponent takes the floor	5 min	8 min
Discussion between the Reporter and the Opponent	5 min	8 min

Questions of the Reviewer to the Reporter and the Opponent and answers to the questions	2 min	3 min
Preparation of the Reviewer	2 min	2 min
The Reviewer takes the floor	3 min	5 min
Concluding remarks of the Reporter	2 min	3 min
Questions of the Jury and grading	2 min	2 min

In the Final PF the procedure of challenge is omitted.

The official language of the IYPT is English. The report has to be presented in English. In the subsequent parts teams can choose to use Russian.

VIII. The teams performance in the Stages

The Reporter presents the essence of the solution to the problem, attracting the attention of the audience to the main physical ideas and conclusions. Standard devices for presentation are blackboard, transparencies- and slide projector. For further devices the teams must use their own equipment.

The Opponent puts questions to the Reporter and criticizes the report, pointing to possible inaccuracy and errors in the understanding of the problem and in the solution. The Opponent analyzes the advantages and drawbacks of both the solution and the presentation of the Reporter. The discussion of the Opponent should not become a presentation of his/her own solution. In the discussion, the solution presented by the Reporter is discussed.

The Reviewer presents a short estimation of the presentations of the Reporter and the Opponent.

Limitation of the number of presentations:

During one PF no member of a team may take the floor more than twice (other members of the team are allowed to make brief remarks).

IX. The rules of problem-challenge and rejection

1. All problems presented in the same PF must be different.
2. *Selective PF*

The Opponent may challenge the Reporter on any problem with the exception for a problem that:

- (a) was presented by the Reporter earlier;
- (b) was opposed by the Opponent earlier;
- (c) was presented by the Opponent earlier.

If such a challenge cannot be made, the bans (c), (b), (a) are successively removed in the given order.

During all Selective PFs the Reporter may reject the challenge three times in total without penalty. For every subsequent rejection the coefficient of the Reporter (see section X) is decreased by 0.2.

All the problems rejected by the Reporter are included in a Rejection List of the team. The rejection of these problems in successive PFs does not involve penalty.

3. *Semifinal PF*

In the Semifinal PF 10 problems are used, which are determined by the LOC according to a Rating List prepared by the participants (each team ascribes integer numbers to problems; the sum of these numbers should be equal to 100).

The Opponent may challenge the Reporter for any of the 10 problems. During the Semifinal PF the Reporter may reject the challenge twice without penalty. For any subsequent rejection the coefficient of the Reporter decreases by 0.2.

4. *Final PF*

Within 2 hours after the announcement of the results in the Semifinal the teams participating in the Final choose their problems. In case teams choose the same problem, priority is given according to the ranking in the Semifinal.

X. The grading

After each Stage the Jury rates the teams, taking into account all presentations of the members of the team, questions and answers to the questions, and participation in the discussion. The marks are transformed into grades and then into points with various coefficients for the Reporter, Opponent and Reviewer according to the scheme:

Mark	5+	5	5-	4+	4	4-	3+	3	3-
Grade	53	50	47	43	40	37	33	30	27

	Reporter	Opponent	Reviewer
Coefficient	3.0 or less	2.0 or 2.2	1.0

The coefficient of the Opponent challenging for the problem “Invent for Yourself” is 2.2, since he takes the risk to face an unknown problem. The coefficient of the Opponent challenging for other problems is 2.0.

If the Jury consists of 5 or 6 persons, the lowest grade is withdrawn in the evaluation of the mean grade. If the Jury consists of more than 6 persons the highest and the lowest grades are withdrawn.

XI. The resulting parameters

1. For a team in the PF

SP (the sum of points) is the sum of mean grades multiplied by the corresponding coefficients and rounded to 1. SP_j is the sum of points of the team taking place j in a given PF.

R (the rating) characterizes the success of a team in the PF. R_j is the parameter of the team taking place j . R_j depends upon j , SP_j and the value of $SP_i - SP_j$ ($i \leq j$). The rating of the team taking place j is determined according to the following table:

	Team's place in the Fight				
	1	2, 3 or 4	2	3 or 4	3 or 4
		$SP_j \geq SP_1 - 6$	$SP_2 < SP_1 - 6$	$SP_j \geq SP_2 - 6$	$SP_j < SP_2 - 6$
$SP_j \geq 290$	5	5	4	4	3
$290 > SP_j \geq 240$	4	4	3	3	2
$240 > SP_j \geq 190$	3	3	2	2	1
$190 > SP_j$	2	2	1	1	0

This rule of evaluation of R holds for all PFs.

2. For a team in the Tournament

TSP (the total sum of points) equals the sum of SP of the team in all PFs,

TR (the total rating) is the sum of ratings of the team in all PFs.

3. For members of a team

The appearance of a team member as Reporter, Opponent or Reviewer is considered successful if all the grades taken into account are higher than 3+. In the successful appearances the member of a team gathers points:

Grade	5+	5	5-
Points	3	2	1

IR (the individual rating) equals the sum of points gathered by a team member in all successful appearances, divided by the number of the grades taken into account.

XII. Selective PFs

In the course of the Selective PFs any one team meets with another team only once, according to the following scheme (numbers ascribed to teams in the scheme are determined by lot):

<i>1st Selective Fight</i>											
Group	18–20 team Fight						15–17 team Fight				
	I	II	III	IV	V	VI	I	II	III	IV	V
Reporter	1	2	3	4	5	6	1	2	3	4	5
Opponent	7	8	9	10	11	12	6	7	8	9	10
Reviewer	13	14	15	16	17	18	11	12	13	14	15
Observer	19	20						16	17		

<i>2nd Selective Fight</i>											
Group	18–20 team Fight						15–17 team Fight				
	I	II	III	IV	V	VI	I	II	III	IV	V
Reporter	11	12	7	8	19	20	17	10	6	7	16
Opponent	16	17	18	13	9	10	9	14	15	11	8
Reviewer	6	1	2	3	14	15	13	1	2	3	12
Observer					4	5	5				4

<i>3rd Selective Fight</i>											
Group	18–20 team Fight						15–17 team Fight				
	I	II	III	IV	V	VI	I	II	III	IV	V
Reporter	18	13	14	15	16	17	15	11	12	13	14
Opponent	5	6	1	19	20	4	4	5	1	16	17
Reviewer	9	10	11	2	3	8	7	8	9	2	3
Observer				12	7					10	6

The distribution of the team leaders among the groups, which is determined below, assures that they do not judge their own team.

The scheme for the Selective PFs with more than 20 or less than 15 teams, should be composed using the same principles.

<i>The team leaders distribution among the groups</i>											
Group	18–20 team Fight						15–17 team Fight				
	I	II	III	IV	V	VI	I	II	III	IV	V
Team leaders	2	3	4	5	6	1	2	3	4	5	1
	8	9	10	11	12	7	8	9	10	6	7
	14	15	16	17	18	13	12	13	14	15	11
	20					19			16	17	

XIII. The Semifinal

The nine teams having the highest *TR* in the Selective PFs participate in the Semifinal. The team taking place 10 to 12 may participate in the Semifinal if its *TR* equals that of the team taking place 9 and its *TSP* differs by no more than 6 from that of the team taking place 9.

Teams and team leaders are distributed among three groups according to the tables below. They are enumerated according to their *TR* (if equal to their *TSP*): the higher *TR* (*TSP*), the lower the number.

<i>Distribution of teams among the groups</i>			
Group	I	II	III
Reporter	1	2	3
Opponent	6	5	4
Reviewer	7	8	9
Observer	(12)	(11)	(10)

<i>Distribution of team leaders among the groups</i>			
Group	I	II	III
Team leader	2	3	1
	5	4	6
	8	9	7
	(11)	(10)	(12)

There can be only one winner of the Semifinal in each group. The winner is determined by, in order, the highest *R*, the highest *TR*, and the highest *TSP*; in case of equality by lot.

XIV. The Final

The winners of the Semifinal participate in the Final. If the team which got the highest TR is not among these teams, it participates in the Final as a fourth team. If there is more than one such team, the decision is taken according to the highest TSP ; in case of equality by lot.

The order of presentation in the Final is determined by the TR , in case of equality by the TSP , in case of equality by lot: the higher TR (TSP), the lower the number in the schemes of section VI.

XV. The winners of the IYPT

1. Team competition

The participants of the Final assure for themselves place II and compete for place I.

The participants of the Semifinal assure for themselves place III. The following places in the Tournament are determined by the value of TR .

2. Individual competition

The Absolute winner of the Tournament is determined by the value of IR . The highest IR , denoted as HIR , serves as a reference. All participants (team members) that have an IR score higher than $0.8HIR$ are “winners” and those having IR higher than $0.5HIR$ receive an honourable mention (for successful participation).

XVI. The Regulations of the International YPT

are established by the IOC and may be changed only by the IOC.

Stuttgart, October 1997