



41st International Chemistry Olympiad

18 – 27 July 2009, United Kingdom

Information for mentors

Introduction

As the number of people participating in the International Chemistry Olympiad is growing the Steering Committee would like to provide some information for the mentors. This document will show new mentors what they can expect and what is expected from them at the Olympiad.

The contents will give a description of the current format of the Olympiads while the formal and official rules can be found in the regulations of the IChO available from our web site: <http://www.icho2009.co.uk/articles/id/3>. All mentors should be familiar with these documents.

This document should be edited and updated regularly by each Olympiad organizer and the Steering Committee. This particular document has been updated the organizers of the 41st IChO and is an updated version of Gabor Magyarfalvi's document¹.

¹ Originally created in 2004 and updated in 2007



General

Teams

Each country can nominate up to four students and two mentors. The selection of the two mentors accompanying a team to the IChO is a national responsibility.

The regulations ask for a good command of English as the proceedings of the Jury require that the delegations participate in the discussion, or at least follow it closely.

Countries may also bring up to two scientific observers to assist with the duties of the mentors. They must be registered as a Scientific Observer and pay an additional cost set by the host country which is 1000 GBP per person for the 41st IChO.

It is helpful if members of the team have been involved in the preparation and selection of the respective national teams. They should be familiar with the preparatory problems and the Olympiad regulations including the syllabus.

Ideally at least one mentor will be a secondary school teacher and at least one should have previous Olympiad experience. The theoretical Jury sessions are split between synthetic and physical chemistry problems – one mentor will be required to attend each session and therefore should be familiar with these problems.

Basic computer and word processing skills (Windows and Word) are also expected from the mentors.

Jury sessions can be very arduous and lengthy, but it is critical that the competition tasks are discussed and agreed by the Jury. To help shorten the session mentors should study the problems and discuss them individually with the authors before the full Jury meeting. Many issues with the tasks can be resolved during one-on-one discussions with the authors rather than involving the entire international jury.

Catalyzer

The Catalyzer is the Olympiad's daily newssheet. It will contain news and photographs about the student participants and their excursions, articles relating to chemistry, culture and also quizzes. Hosts usually welcome contributions from participants!

Preparing for the Olympiad

Before the Olympiad:

The preparatory problems are available to download from our website:

<http://www.icho2009.co.uk/articles/id/13>

The solutions have been sent to the Head Mentors or Contact persons via e-mail.

Please note that neither the hard copy of the preparatory problems nor the hard copy of the solutions will be sent to head mentors.

Solutions will not be available to the general public before the Olympiad since several nations use these problems in national exams.

Registration

Registration is usually organized through the head mentor for each country.

The invitation letters should be sent by December the year before the Olympiad.

The registration data should be provided on time:

01.04.2009	Registration of the country
01.05.2009	Registration of the mentors
01.06.2009	Registration of the students
15.06.2009	Registration of the travel details
15.06.2009	Registration of the guests
15.06.2009	Final payment due (including guests fees)

If deadlines can't be adhered to, mentors should inform the organizers in time:

info@icho2009.co.uk

Visa information

The host countries can assist the teams to meet visa requirements. Please be aware that the process of the visa application could take **4-6 weeks**. Invitation letter can be requested from our office.

VISA information:

www.ukvisas.gov.uk

The list of the countries who need to apply for a visa is available at:

<http://www.ukvisas.gov.uk/en/doineedvisa/visadatvnational>

The list of the countries who can apply for on-line visas are available at:

<http://www.visa4uk.fco.gov.uk/CountrySupport.aspx>



Provisional programme of the 41st IChO

Day 1 – Saturday, 18th July 2009

Arrival

Please note that your team has to make its own way to and from Cambridge. Please use the travel information below to prepare for this journey:

A co-ordinator will be provided at all airports and railway stations where the teams arrive. They will be familiar with arrival times, emergency phone numbers and travel information. The delegates should meet with our co-ordinator who can give travel information and advice on how to get to Cambridge.

We have prepared some information and suggestions on how to get to Cambridge from the main airports. If you have any questions please contact us and we will be more than happy to help you find the best option for your journey.

Journeys will require either underground and train travel or coach travel.

London underground lines are all marked with different colour. Please be aware of the direction of travel and the name of the stations where you have to change or get off. We have included the same signs you will need to find and follow.

Secondly there are peak and off-peak times which depend on the time are you planning to use the London Transport system. Most of the countries will usually arrive on Saturday which is an off-peak time. But as the departure day is a Monday you might have to travel in the peak period. We suggest that before you book your flights you have a look at the websites below to be familiar with the travel costs from Cambridge to your airport.

Please note that you are able to book your train and coach tickets on-line well in advance which could be more economical.

London Transport: <http://www.tfl.gov.uk/>

You can find a journey planner, ticket prices, station locations and download the tube map, etc.

National Rail Service: <http://nationalrail.co.uk/>

National Express (coach service): <http://www.nationalexpress.com/home.aspx>

Ranked below are the five London airports, 1 – is the closest, 5 – is the furthest from Cambridge.

1. Stansted Airport
2. Luton Airport
3. London City Airport
4. Heathrow Terminals 1, 2, 3, 4 and 5
5. Gatwick Airport



1. Stansted Airport

You can travel to Cambridge either by train or by coach to Cambridge:

By coach:

The journey takes approximately 50 minutes – 1 hour and costs £15-£20 (return)

By train:

The journey takes approximately 35 minutes and costs £15-£20 (return)

Prices are calculated for one person (age 16+) and are return tickets. Prices will depend on your exact travel time.

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2. Luton Airport

By coach:

The journey takes approximately 1 hour and 30 minutes: £15-£20 (return)

There is no direct train connection between Luton and Cambridge, you would have to travel to London and change.

Prices are calculated for one person (age 16+) and are return tickets. Prices will depend on your exact travel time.

3. London City Airport

DLR

The airport has a direct connection to the DLR service. You should take one which terminates at BANK station, where you change to the **Northern** line (direction of travel EDGWERE or HIGH BARNET) and get off at King's Cross station. Then follow the signs to King's Cross Railway Station: ➡

At King's Cross Station you can meet our coordinator at the ticket machines and ask for help. Cambridge trains depart approximately every 30 minutes.

Costs:

1 ticket from London City airport to King's Cross Station will cost £4 and is valid for the DLR and the underground. You don't need to purchase a second ticket!

King's Cross Station to Cambridge:


Return tickets can be up to £40 per person, the price will depend on what time your delegation arrives in London. Peak times are more expensive than off-peak.



4. London Heathrow Terminals 1, 2, 3, 4 and 5

Piccadilly

The easiest but probably not the quickest way is via the underground's line from your terminal (direction of travel Cockfosters) and get off at KING'S CROSS station. This trip takes around 55 minutes.

Follow the signs from the underground station to King's Cross railway station: 

At King's Cross Station you can meet our coordinator at the ticket machines and ask for help. Cambridge trains depart approximately every 30 minutes.

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Costs:

1 ticket from Heathrow airport to King's Cross Station will cost £4.

King's Cross Station to Cambridge:

Return tickets can be up to £40 per person, the price will depend on what time your delegation arrives in London. Peak times are more expensive than off-peak.

4. Gatwick Airport

This airport is the furthest from Cambridge.

By coach:

The trip takes approximately 4 – 4.5 hours and a return ticket will cost about £40 per person.


By train:

The trip takes 2.5 – 3 hours including two changes. A return ticket will cost £40 - £60 per person.

You travel from the airport by the Gatwick Express which runs to and from London Victoria Station every 15 minutes. This part of the journey is 35 minutes and a return ticket is approximately £30 per person.

Victoria

From London Victoria station take the underground line (direction of travel Walthamstow Central) and get off at KING'S CROSS station.

Follow the signs from the underground station to King's Cross railway station: 

At King's Cross Station you can meet our coordinator at the ticket machines and ask for help. Cambridge trains depart approximately every 30 minutes.

Costs:

1 ticket from Victoria to King's Cross Station will cost £4.

King's Cross Station to Cambridge:

Return tickets can be up to £40 per person, the price will depend on what time your delegation arrives in London. Peak times are more expensive than off-peak.



Cambridge Railway and Bus Stations

Teams will be met at Cambridge railway and coach stations and transferred to their Colleges. Mentors and students will be accommodated in separate Colleges.

The student team will also meet their guide at the station in Cambridge. As in previous Olympiads the guides will stay with the students and accompany them throughout the Olympiad. The guides are university students who can speak the native tongue of the students and English.

Some accommodation at a special rate is available for delegations arriving early or leaving later but this is limited and must be requested from the 41st IChO Office before 01.06.2009
info@icho2009.co.uk

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College Accommodation

Mentors

Robinson College in Cambridge

<http://www.robinson.cam.ac.uk/>

St. Anne's College in Oxford

<http://www.st-annes.ox.ac.uk/>

Students

St. John's College

<http://www.joh.cam.ac.uk/>

Trinity College

<http://www.trin.cam.ac.uk/>

St. Catharine's College

<http://www.caths.cam.ac.uk/home/>

If you have any question regarding the accommodation please contact our office not the Colleges! (info@icho2009.co.uk)

During the registration procedure the team members must show their passport and health insurance which must be valid for the whole of your stay in the UK. We will also require confirmation of departure times so we can organise transfers.

The delegations must sign an academic code that includes a voluntary communication restriction between students and mentors and observers between the end of the Opening Ceremony and the Reunion Party.

Please make your students aware that their mobile phones must be handed over at registration and will only be returned to them at the Reunion Party.

All participants will receive a badge, showing their country and their status (student, mentor etc) indicated. Please wear these throughout the event.



Day 2 – Sunday, 19th July 2009

Mentor Programme

The luggage will be collected in College after breakfast and transported to Oxford.

Please ensure you keep anything you will require during the day.

The Opening and Closing Ceremonies and banquets are usually formal events, when some nations wear a special team uniform or suit. The countries will be introduced during the Opening Ceremony.

After the Opening Ceremony the mentors will inspect the laboratories where the practical exam will take place. They will check and sign-off the workstations of their students.

They will also receive two copies of the Practical exam and have an opportunity to meet with the Authors when they arrive in Oxford.

Correction of phrasing and English spelling should be raised in a Jury meeting only if it can affect the meaning of a question.

After the Scientific Committee has had a chance to discuss the suggested changes, the 1st Jury session can begin.

All of the mentors should attend the sessions to be aware of the issues concerning the exams. Moreover, the regulations require a 75% presence for a valid voting procedure.

The final text of the exams, marking scheme (blue points) and red points are all introduced for formal acceptance during the meeting.

Once the final text is agreed upon, it will be available both in printed (duplicate) and as a MS Word document to the head mentors of the participating countries.

The final versions of the exam must be handled by the Head Mentor.

Student Programme

After the Opening Banquet the students will have a guided sightseeing tour around Cambridge.



Day 3 – Monday, 20th July 2009

Mentor Programme

This is the day allocated for the Practical exam translation and the following equipment will be available for each country:

1 laptop with English keyboard and an additional external keyboard in an alternative language (if requested during on-line registration). The software will be Microsoft XP (English) and Microsoft Office 2007 English version. MS Office Language Pack is available but must be requested during on-line registration.

Please see the available languages at:

<http://office.microsoft.com/en-us/suites/HA102113701033.aspx>

1 printer shared between two countries.

Technicians will be on site to assist with any problems. There will be NO internet connection.

Teams using a common language may cooperate during the translation. It will be useful to let the organizers know this beforehand so that computers can be set-up on adjacent desks.

The organizer decides whether to allow the use of personal computers. Please be aware that there will be only a limited possibility of charging your own laptop and you will need a special adapter .

Lunch and dinner will be provided in the same venue as the translation.

The practical translations must be finished by 20:00.

Student Programme:

The students will spend the day at Belvoir Castle and take part in medieval activities.

Day 4 – Tuesday, 21st July 2009

Practical Exam

Some issues quite often arise in the jury meeting regarding the practical exam. The following suggestions were accepted several times previously.

It is possible to have split laboratory sessions. That is, a morning session and an afternoon session can be held. Alternatively, laboratories can also be rotated in two sessions. Students obviously must be strictly separated and the organizers must ensure that the equipment has been properly cleaned and dried if it is being reused.

Theoretical questions in the practical, if any, should pertain to the essence of the experiment.

The following scheme for the grading of experimental measurement results has worked well in the past:

Full marks should be awarded if the result is in a range that reflects the values expected by the examiners. The expected master value must come from the analytical procedure performed on the exam day.

No marks should be given to results outside the limits of acceptable values.

Both ranges, expected and acceptable should reflect the examiners experiences.

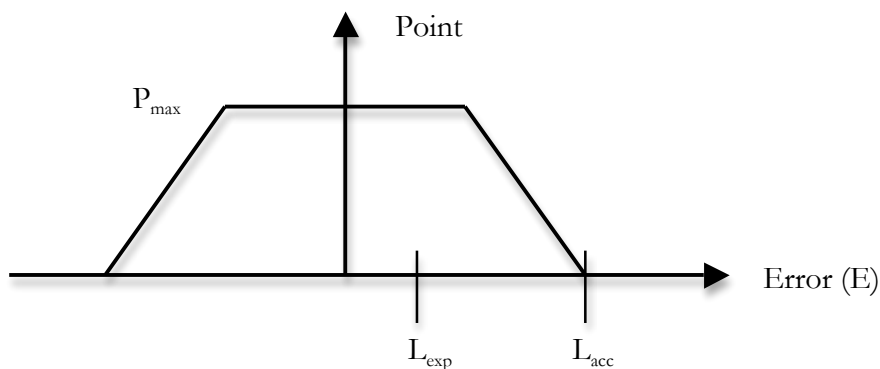
Between these two, a linear scale should be applied.

Numerically: P_{\max} points, if $0 \leq |E| \leq L_{\text{expected}}$
0 points if $L_{\text{accepted}} \leq |E|$

$$P_{\text{max}} \cdot \left(1 - \frac{|E| - L_{\text{exp}}}{L_{\text{acc}} - L_{\text{exp}}}\right) \quad \text{if } L_{\text{expected}} \leq |E| < L_{\text{accepted}}$$

P_{\max} = maximum points
 E = error
 L = range limits

Graphically:





Ranges need not necessarily be symmetrical. The accepted range above the true melting point should be rather narrow for example.

Typical values for a titration would be
L_{expected} = 0.5% relative error in the volume.
L_{accepted} = 3 % relative error in the volume.

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Students should be allowed to decide on the number of parallel measurements (titrations) they make. Only the final value (probably a mean) as reported by the student should be graded. Marks should depend on experimental values, but not on precision. (This is based on the fact that students may make up concordant results.) The emphasis should be on marking practical work, therefore the results should be recalculated uniformly. Errors in the calculations should invoke a minor penalty, the magnitude of which should be suggested by the organizers and approved by the International Jury. Serious mistakes in applying the rules of evaluation of experimental errors can be penalised (e.g. number of significant figures differs in more than two digits from the correct, rounding errors exceeding accuracy). The magnitude of the penalty should be suggested by the organizers and approved by the International Jury.

Students can be penalized for asking replacement samples or additional reagent or broken labware.

It is very important for a manageable Jury Meeting that the mentors study the exam and meet with the authors individually to discuss their issues.

Mentor Programme

The mentors will have a guided sightseeing tour around Oxford during the morning.

The Theory problems will be given to the mentors (two hard copies per country) just before lunch is served in the College. After lunch the mentors can meet with the authors and discuss the Theory problems. These meetings will take place in the College.

Student Programme

The Practical exam will be held in two locations and there will be a safety talk just before the exam at each laboratory.

After breakfast the teams will walk to the laboratories where the Practical exam will be held. Once the exam is over lunch will be served. After lunch they will have free time but can attend several optional programmes.



Day 5 – Wednesday, 22nd July 2009

Mentor Programme

The theory translation starts at 09.00 am and mentors will use the same laptops as for the practical translation.

Lunch and dinner will be provided at the same venue as the translation.

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Student Programme

The students will have a quieter day between their exams. They will follow a trail around Cambridge which will visit many of the most important sights and include punting and games. At the end of the day the best teams will take part in a final quiz to decide the winning team.



Day 6 – Thursday, 23rd July 2009

Mentor Programme

The mentors will travel back to Cambridge via London. The luggage will be collected from College after breakfast and returned to Robinson College in Cambridge.

The mentors will have a whole day excursion in London before they are taken to the Natural History Museum where the Reunion Party will be held.

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Student Programme

After their exams the students will have lunch and then go to London by coach to join the mentors at the Natural History Museum for the Reunion Party.

Please note that the Reunion Party will finish around 23:00 when we will return to Cambridge.



Day 7 – Friday, 24th July 2009

Mentor Programme

After the examinations, the answer sheets are copied. One is marked by the authors, the other by the mentors who will receive their copy at breakfast today.

Marking

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A detailed marking scheme should be presented with the exam to the International Jury. Points for partial solutions are best decided by the organizers using common sense during correction, and they should be awarded uniformly as all possible errors can not be pointed out beforehand.

E.g.: If the question is to provide a balanced chemical equation, then partial credit should be awarded to those who know the reaction partners, but fail to balance correctly.

The Jury should only discuss partial marks in the most critical cases. Students are asked and are expected to show their work. This will help to award partial marks. If a student omits simple or trivial steps from his line of reasoning, or uses a different solution, he should receive full marks, if the results explicitly asked for are correct and his work is shown. However, if just the result of a complicated problem is given without any explanation, no points are due.

Full marks should be awarded for a question, if the student solves it correctly and consistently using a faulty result from another question (consequential marking). There is no double penalty. The grading is usually done so that the marks are integer (blue points). The final (red) points (60 for theory and 40 for practical) are divided between the tasks using the predetermined weights.

Rooms will not be provided for the marking, however there will be a common room available in the College where lunch and dinner is served.

Student Programme

The students will spend their day in a forest close to Cambridge. They should be advised to bring suitable clothing which could be very dirty at the end of the day, but it will be absolutely worth it!

Further details will follow so please visit our web site regularly!



Day 8 – Saturday, 25th July 2009

Mentor Programme

Arbitration will allow mentors and Authors to compare their marking.

A timetable will be created randomly which will allow approximately 30 minutes with each author to discuss the problems.

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If agreement is not reached the delegation will be asked to return later. If the author and the delegation are unable to reach a final agreement the chair of the scientific committee has to make the final decision.

Sometimes the discussions can become quite heated so we ask you to handle the situation tactfully.

The final scores of the students will be available for their mentors to have a final check.

The 4th Jury Meeting will be held this evening when the main business will be the allocation of medals.

A list will be presented which shows the only the difference in absolute number and percentage between the results so that final results are not known until the award ceremony.

This meeting may also be used by the Steering Committee to discuss general questions concerning future Olympiads, regulations or any other business of importance to the Jury.



Day 9 – Sunday, 26th July 2009

There will not be any organized programme before the Closing Ceremony which is to be held in King's College Antechapel.

As in previous years the prizes will be awarded first to those with an Honourable Mention, followed by bronze, silver and finally gold. After the medals have been presented to the students the IChO flag will be formally handed to Japan as the Organizers of the 42nd IChO in 2010:

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<http://www.icho2010.org>

The Closing Ceremony will be followed by a Banquet which will also take place in King's College.

The last issue of the Catalyzer contains the allocation of the medals and will be available after the Closing Ceremony.



Day 10 – Monday, 27th July 2009

The final day of the Olympiad when the delegations return home.

Those delegations who will leave later and need additional accommodation should be contact our office (info@icho2009.co.uk) to request the necessary accommodation. These countries might have to move to another collage.

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Please be aware that transfer will be provided only to Cambridge railway or bus station. (Travel advice will be available in advance and during the Olympiad as well.)



Sample Documents

Some parts of the exams do not change significantly from year to year such as the instructions accompanying the exams and the safety regulations. Please read through this relevant samples that can be translated beforehand to save time in the translation sessions. Team members can also become aware of the rules before the Olympiad.

At all times while you are in the laboratory you must wear safety eye glasses or your own glasses if they have been approved, and use the pipette filler bulb provided. You will receive only ONE WARNING from the laboratory supervisor if you remove your glasses or fill a pipette by mouth. A second infringement will be considered a major fault incompatible with further experimental work, and you will be dismissed from the laboratory with a resultant zero score for the entire experimental examination.

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Do not hesitate to ask a demonstrator if you have any questions concerning safety issues.

Please carefully read the text of each experimental task and study the layout of the answer forms before you begin your experimental work.

Work must begin only when the START command is given.

Write your name and personal identification code (posted at your workstation) on each answer sheet.

You have 5 hours to complete all of the experimental tasks, and record your results on the answer sheets. You must stop your work immediately after the STOP command is given. A delay in doing this by 3 minutes will lead to cancellation of the current task and will result in zero points for that task.

All results must be written in the appropriate areas on the answer sheets. Anything written elsewhere will not be marked. Do not write anything on the back of your answer sheets. If you need more paper for working or a replacement answer sheet, request it from the supervisor.

When you have finished the examination, you must put all of your papers into the envelope provided. Only papers in the envelope will be marked.

Do not leave the examination room until you are directed to do so.

Use only the pen and calculator provided.

Use only the distilled water, and use the appropriate waste containers for disposal of chemical and other waste materials.

The number of significant figures in numerical answers must conform to the rules of evaluation of experimental errors. The inability to perform calculations correctly will result in penalty points, even if your experimental technique is flawless.

This examination has **xx** pages and **xx** pages of answer sheets.

Chemicals and/or laboratory ware can be purchased if used up or broken. The cost of each purchase will be the loss of **xx** point.



The official English version of this examination is available if you wish to see it.

Write your name and personal identification code (posted at your workstation) in the upper corner of the first page of each problem's answer sheet. Write your name and code on all remaining answer sheets.

You have 5 hours to complete all of the tasks, and record your results on the answer sheets. You must stop your work immediately after the STOP command is given. A delay in doing this by 3 minutes will lead to cancellation of the current task and will result in zero points for that task.

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All results must be written in the appropriate areas on the answer sheets. Anything written elsewhere will not be marked. Do not write anything on the back of your answer sheets. If you need more paper for working or a replacement answer sheet, request it from the supervisor.

Write relevant calculations in the appropriate boxes when necessary. If you provide only correct end results for complicated problems, you receive no score. When you have finished the examination, you must put all of your papers into the envelope provided. Only papers in the envelope will be marked.

Do not leave the examination room until you are directed to do so.

Use only the pen and calculator provided.

A Periodic Table and a table of constants will be provided for your use.
Take all atomic masses and physical constants from there.

This examination has **xx** pages and **xx** pages of answer sheets.

Total points for this examination is **xx**.

An official English language version is available if you wish to see it.