
APPLICATION GUIDELINES

MATHS BEYOND LIMITS 2021

QUALIFYING QUIZ

Qualifying Quiz (QQ) is the major part of the application. We ask you to solve three (out of five¹) *olympic* problems – which are similar to usual problems from maths competitions, and three *exploratory* ones – which are less standard and meant to help us understand your mathematical maturity.

We accept solutions only in pdf format. They can either be scans of handwriting (provided it is legible!) or typed in \LaTeX or something else.

Do not get upset if you find the problems difficult as they are meant to be demanding, thought-provoking and getting the best out of you. Also, do not hesitate to submit just partial solutions as sometimes they may be very near completion – this applies especially to exploratory problems, where even seemingly small progress might get you some points.

You can use books or the Internet to look up definitions or formulas, but do not try to look for the problems themselves! In case the problem statement is unclear to you even after getting help from the aforementioned sources, please contact us. You may not consult or get help from anyone else. Violation of any of these rules may permanently disqualify you from attending Maths Beyond Limits.

APPLICANT QUESTIONNAIRE

Applicant Questionnaire (AQ) consists of a Google Form to fill out and a **personal data processing consent form you have to attach**. After submitting the form, you are still able to edit it, until (and including) **31 May 2021 (23:59 CET)**, which is the deadline.

You do not have to fill it out all at once — if you want to take a break submit it and edit later. If you want to work with it, it will be probably most useful for you to submit it at the very beginning, after filling out just the mandatory fields, even with some random stuff.

Personal Statement is essentially an essay allowing us to get to know you a little bit, understand your mathematical background and interests. You are given a degree of freedom in what you write over there, but below we provided you with questions which you may find useful.

How did it happen that you became interested in mathematics? How do you develop your mathematical passions? Are there any people that influenced you largely on your mathematical journey? What branches of mathematics do you like most? Why? What branches, topics are your weak spots? Have you read any mathematical books you find exceptionally intriguing? Which ones? What is the most beautiful problem you've ever solved? Is there any particular problem (not some well-known hypothesis), whose statement you understand, but which you cannot solve? Tell us about some other hobbies you have (e.g. skating, crocheting, knitting, watching anime).

¹ There is no point in sending more than three problems from this part – if you did this, we will grade just three of them anyway.

EVENING ACTIVITIES

Applicant Questionnaire allows you to propose up to three Evening Activities (EAs), which are non-mathematical activities happening every evening, about 60-120 minutes long. Most of them are run by the participants themselves. Proposing them is not obligatory, but it is definitely very beneficial, as we do take the proposals into account a lot! We want the camp to be filled with super-cool events and you can be one of the people contributing to that!

Some of the ways to make a good EA, together with examples from previous MBLs are below.

- Make it an introduction into some not-so-popular thing that you are interested in.
e.g.: *Chinese Language, Improvisation Workshops, Handstands and More, Singing Workshops, Karate, Tango Session*
- Make it a really random and funny thing.
e.g.: *Recognition of Old Mobile Phones Quiz, Spelunky Tournament, Kebab Making, Pique Turns, Make a Postcard!*
- Make some interesting vintage thing.
e.g.: *Donnie Darko: Movie + Discussion, Introduction to Swedish Cinematography, Crêpes Artistiques, Nordic Folk/Metal, Xiangqui*
- Make it some classic group integrating thing.
e.g.: *Karaoke, Vast Range of Quizzes*

To get more good ideas do check out last year's [camp brochure](#).

There are also things you should avoid when proposing an EA.

- Avoid giving proposals that are somewhat trivial and do not require any preparation (in particular just some specific board/card game).
e.g.: *Card Games, Board Games, FIFA, MAO, SET, Mafia*
Some way to make such proposals better is to do them in the form of a tournament or workshops (where you actually teach some techniques) and make them more specific and creative.
e.g.: *Contract Bridge Workshops*
- Avoid activities that will certainly not take 60 minutes.
e.g.: *"Kalambury", Puzzle, Ninja*
- Avoid activities that are organised as Special Events (look it up in [camp brochure](#)).
e.g.: *Mountain Trip, Campfire*
- Be aware of the restrictions that the accommodation has. We do not have any ovens, lakes, old abandoned uranium mines etc. We do have a projector, lots of cardboard, a tourist cooker and a forest nearby. If you want to propose something that has special requirements either ask us if it is a good idea or be prepared to provide the materials you need.
e.g.: *Making Cookies, Table Tennis Tournament*
- Do not propose just sports as they are to be organised anyway. If you want to propose a sport-connected activity make it somewhat more involved.
e.g.: *Frisbee, Sports, Football*
- Do not propose just film screenings. If you want to propose a movie-connected activity make it somewhat more involved.
e.g.: *Flatland Watching, Movie Night*
- Do give good description of your proposal, not some vague title.
e.g.: *Ice-breakers, Circle Activities*

A good EA proposal can look like this:

IMPROVISATION WORKSHOPS — being a member of a youth theatre I would like to give the other participants a feel of what doing theatrical improvisation is like. I want to do a few fun exercises increasing the body-awareness, creativity in imagining unexpected turns of random situations and the confidence in improvising. Most of them will be group activities so it should help the participants to integrate. It would be great if I could be provided with speakers and some big room.

Also, in previous years we had some EAs group proposals. If you and some of your friends are applying you can propose an EA together! However, we require the groups to be no bigger than three persons. In order to do so, all of you should put an identical proposal and make a note saying which persons are in your group.

Note: Be aware that proposing an EA means you are willing to organise it when accepted (but does not mean we will for sure ask you to do so).

CAMPER TALKS

Camper Talks are 25-minute long presentations given by campers. They should tell about some mathematical or maths-connected phenomenon in a swift and light way. Again, they are not mandatory but can serve you a big favour when your application is assessed.

To get more good ideas do check out last year's [camp brochure](#).

Here is an example of a description of a Camper Talk:

RANDOM WALKS ON GRAPHS — In the talk we try to calculate average time it would take to walk (randomly) from given vertex A to another given vertex B on various graphs and then derive the general formula.

Note: Be aware that proposing a Camper Talk means you are willing to give it when accepted (but does not mean we will for sure ask you to do so).

SEMITUTORS

Being a semitutor at MBL means running yourself at least one full time (three-day-long, 80 minutes each day) Mathematical Class (MC). You will be asked to prepare handouts well before the camp and also to practise your class with an experienced mentor. We ask you to give some classes proposals in the last form — if we choose any of them you will become a semitutor. If you do not get accepted as a semitutor we will consider your application as a regular participant.

Again, we encourage you to take a look at the MCs from last year in the [camp brochure](#). It is also there that you can find some handouts from the classes — they should give you more insight into how MCs are run.

When thinking about a good MCs proposal you should consider these factors:

- Think about topics you understand. It can be fun to learn new things and then tell others about it, but on the other hand it is unpleasant for the audience when the lecturer is trying to figure out the proof during classes. You cannot properly teach what you have not understood yet.
- Choose something you are passionate about. Everybody likes seeing people talking about things they are truly keen on.

A good Mathematical Class proposal can look like this:

COMBINATORIAL GEOMETRY — Combinatorial geometry is a mixture of interesting mathematical areas such as geometry, topology, combinatorics and algebra. Most of the problems are easy to understand but the solutions require some clever ideas. For example, a typical question would look like this. Can you always cut a cake into six parts, such that each part has the same amount of candles on it? What if you can only use your knife three times? We will work through some problems to understand the basic definitions and ideas, and I will also talk about the active research areas in this field. The class requires just the basic understanding of euclidean geometry.

FREQUENTLY ASKED QUESTIONS

What about COVID-19?

For now, MBL 2021 is still going to take place and there are no changes to the timeline. We are monitoring the situation closely and will follow WHO and governments' guidelines. In case the in-person camp is unsafe, we will move online. Last year we managed to organize a camp and did not record any cases of COVID-19.

Most likely we are going to require negative tests and also require everyone to take a rapid antigen test upon arrival.

Do I have to fill out AQ at one sitting?

No! After submitting, you will receive edit link, valid until application deadline. Hence, if you want to take a break just submit the form and edit it later.

How much does the camp cost?

The first five editions of the Maths Beyond Limits camp were free for the participants. This year, however, we cannot guarantee that yet. Therefore we may ask participants to pay the fee of up to **€150**. In special cases we may provide financial aid, which is to be discussed individually upon acceptance.

However, unfortunately we cannot reimburse travel expenses of the participants. The other additional cost may be covid test in your home country. We will try to pay for the on-site testing ourselves, though.

Note: We are still looking for sponsors and waiting for the grant results, so most probably the camp will turn out to be free. Financial issues should not deter you from applying!

I am from country X. Can I apply?

Yes! People from all over the world can apply!

I am 14 or 20 years old. Can I apply?

The camp is aimed for students aged 15–19. The most important requirement is that when applying you **must** be a middle/high school student. We can make some exceptions for younger and older students only if they satisfy this condition.

There is school in September. . .

We are aware that in many countries school starts during or before MBL. In the previous years we wrote formal letters asking for permission for school absence to the headmasters or class counsellors and only one of the applicants (ever) couldn't come because of school. We will do as much as we can to assure that there are no problems this year either.

I have another question.

Maybe you can find the answer in one of the previous years' vlogs , on our [website](#) or [Facebook fanpage](#). If not, feel free to email us at mathsbeyondlimits@gmail.com!