

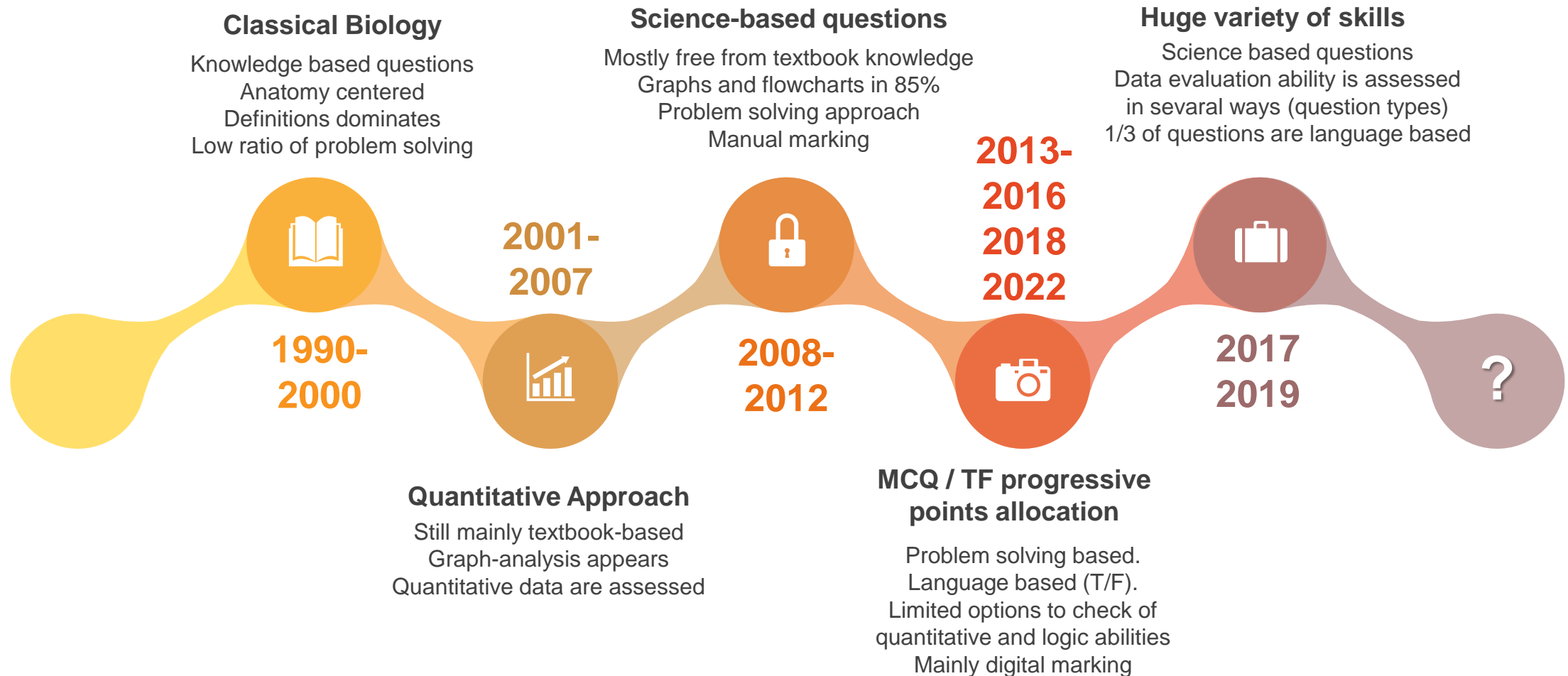
# Assessment at the IBO

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# Milestones of IBO Theory Tests



# Who are good IBO competitors?

## Basic Textbook Knowledge

They know the most important approaches and facts in Biology. Usually we define this as a „Campbell-knowledge“.

## Pattern recognition ability

Doing science in Biology requires a lot of schematic patterns to be aware of. Contestants knowing and recognizing more patterns are more successful.

## Variable test conditions tolerance

Each IBO-weeks are different from each other. Different time zones, different food, different organisation, different test venues... They should be able to accommodate to any environment.

## Understanding quantitative methods

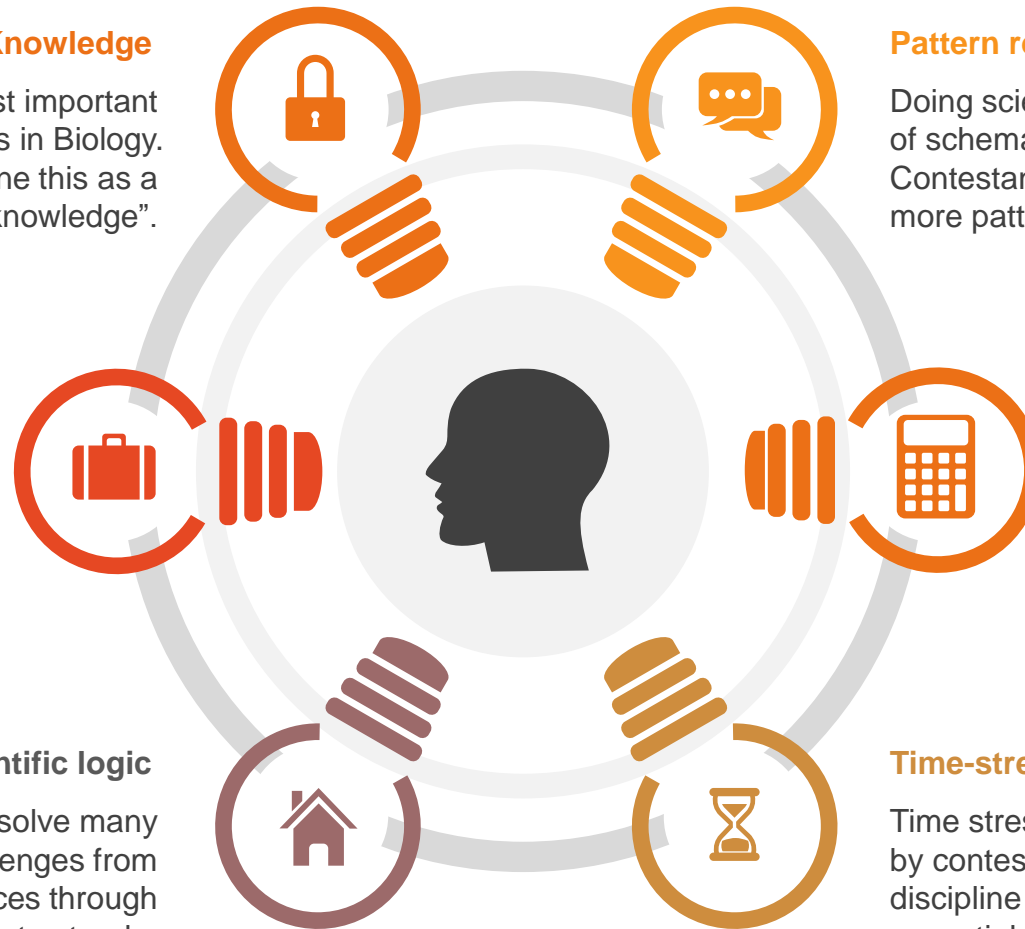
Estimation and punctual calculations are essential to be a successful IBO competitor. This ability requires the knowledge of some maths, physics and chemistry, too.

## Being aware of scientific logic

As a scientist, students should solve many logical problems. This includes challenges from hybridising nucleic acid sequences through planning experimental variables up to stand a plausible explanation for experimental results.

## Time-stress management

Time stress is the most frequently mentioned issue by contestants when speaking about the tests. Self discipline to give a guess after three minutes is essential to be a good IBO test solver.



# Problems to solve

## Question content should focus on future issues

The content of the question should reflect on those problems which require to understand future challenges. E.g.: in ecology, questions shouldn't focus only on current situation of an ecosystem, but on the evaluation of possible complex solutions.

## Digital marking software's features

Digital marking is a huge and definite advantage to spare time and human resources during IBO. On the other hand the software should have the abilities to assess calculation results, matching and ordering questions, too.

## Wording of questions

IBO questions should avoid the language based understanding. This often appears in T/F questions when using modalities. In different languages people use different modalities therefore translating is always a kind of interpretation, too.

## To avoid hidden contents

Even gold medalist contestants are often surprised when they read the „official“ explanation of a T/F question's solution. Students are trained to evaluate the information the text provides explicitly and they usually don't expect hidden information to assess when they decide whether a statement is T/F.

## The length of a question and options

It would be highly important to avoid too long texts. All texts and questions together should fit one page if printed and one screen if solved on computer / tablet. Nowadays students are less able to focus on one problem and it is highly disturbing for them to change pages / screens when they are solving a question.



# „Optimisation” of Theory tests



## Time stress during the test

Though a time-limiting habit is existing in large international aptitude tests to find the most appropriate students – in everyday science time stress is rarely present. To check the timeframe 8-10 volunteer Jury members (mostly former competitors and teachers) should solve the papers onsite.



## Recurring check of the questions

There should be several checking rounds with different approaches. International advisors can do the content check. Skills / abilities balance should be checked by teachers. Language check should be done by native English speakers. Time check indicated above.



## Connections to NBO tests

IBO Organisation should recruit volunteers or professionals for fee to evaluate the NBO questions. This method would give a chance to see on what basis different countries are doing selection process. The results can be a starting point for more democratic question-writing.



## Skill based list instead of topic based

As we have a content (topic) distribution agreement, we should have a skill / ability list with percentages. Later on, this can be the more important checklist, as nowadays, there are no „clear” topics. E.g.: some ecological diversity problems should contain molecular biology knowledge, too



## Clear requirements

The above mentioned list of required skills should be introduced to the IBO community and should be followed by the question writers and test editors. The balanced list of skills and abilities should be checked before publishing the tests to the Jury.



## Host country’s topics and question writing

Many times host country cannot provide enough question writers, nevertheless they are aware of locally important research and biology based issues in their country. It is not necessary to write questions by the host country –it is enough to provide 60-70 locally important research papers / issues. Professional / volunteer question writers can do the questions and edit the tests.





# A possible process of an IBO test

## 1. Question „germs” are sent in

A pool (a drive with limited availability) should be created for question ideas. At this stage they can be only topics / research papers / formulated questions. The pool should contain min. 100-120 ideas until the **end of March**.



## International Jury

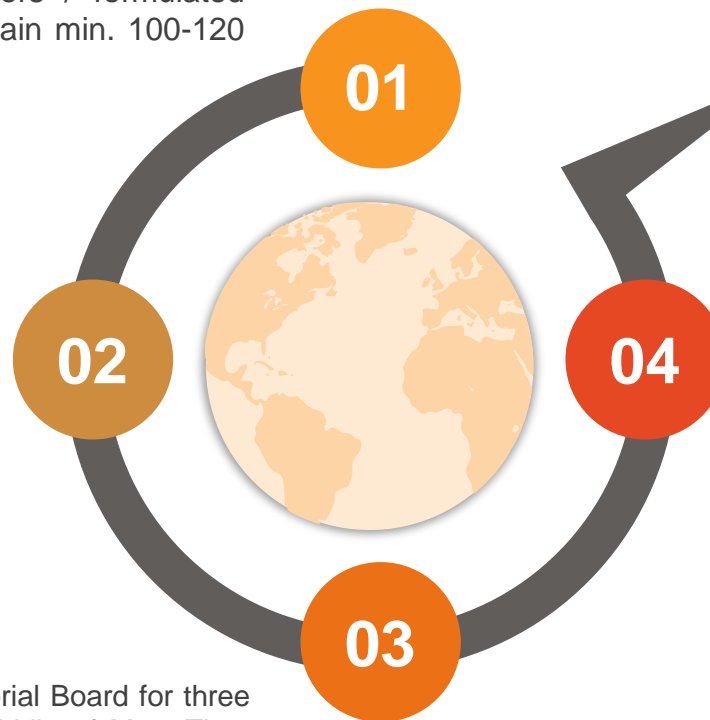
International Jury receives the tests as usually happens. At the first day 8-10 volunteers (mostly former competitors and teachers) solve the two tests, to check the time needed to solve the papers. They report on their proposal on the length (exclude or include some questions). The International Jury approves each questions and the two papers, as before.

## 2. Question writing

Host country’s team or international question writers make all questions. They pay attention both to the appropriate distribution of topics and skills. International advisors can also play a crucial role in this step. Their work should be done until **15th May** as two test papers (and possible substitute questions).

## Editorial Board – instead of Subjury onsite

IBO AGM should vote on eight-ten members of Editorial Board for three years. They start to work with the papers on the middle of May. They check again the appropriate distribution of skills and topics, they check the English quality to avoid hidden-information or modality based questions. Their work can be continued onsite in person **one week before the IBO week starts** („Subjury”). EB members cannot be involved in their country’s team preparation from 15th May – Declaration.



# Take away message 😊



## **IBO tests constantly evolve**

If we look at the history of IBO, we can recognise a definite evolution of the test papers. To keep up this constant adaptation, we should reflect on current changes in science education.



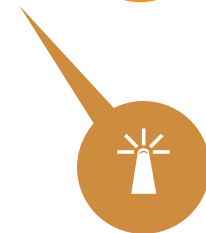
## **Two concurrent approaches to the tests**

In the last few years we could see two totally different approaches how to create a good IBO test. One approach emphasises the diversity of abilities to test, the other approach tries to unify all question types into an MCQ / true-false test.



## **Take the advantages of all options**

To use the advantages of the two approaches, we should keep the diversity of question / skills / abilities types and the easy process of marking at the same time. We should update the test softwares to make them appropriate to assess different skills.



## **Complex tasks should be done and checked by the community**

These requirements should be fulfilled only if we do it together. All Jury members contribution is welcome and highly encouraged. Sharing the opinions and tasks we can have more appropriate and widely accepted test papers in the future.