

SCIENCE CUP – BEPPO 2019



POHÁR VĚDY
SCIENCE CUP

Category 4 – High School

1st round – January – deadline 31. 1. 2019 23:59

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Introduction

Dear competitors, welcome in the first round of the already eighth year of the Science Cup – BEPPO 2019. Before you start working, please spend some time on this information on tasks, solutions, and evaluation.

Every month's assignment includes creativity task (20 % of the total evaluation), theory task (30 %), and practical task (50 %). The solution procedure of individual tasks should be described with your own words and documented with your own photos or pictures.

For each assignment solution, there is always one month. The solution must be handed in on the last day of the given month before 23:59, when the assignment is closed.

The solution must be uploaded to the Science Cup web interface in the given period as one file in PDF format, not exceeding 10 MB in size. All the content of the solution (texts, drawings, schemes, photos) cannot exceed 3 pages of A4 paper format, and should be easily readable (simple font, minimal font size 11 pt.).

We can imagine you can write and fill with pictures far more than only three pages. The judges, however, need to have the possibility to read and fairly evaluate all the solutions. Thus, all the solutions that would not meet the given criteria, would get, unfortunately, zero points. On the contrary, if your solution gets full marks, you can get 20 points for creativity, 30 points for theory, and 50 points for practice. In total, you can reach to 100 points in each of the four rounds of the corresponding part of the competition. Each evaluation consists also from the written feedback, so you know what your strong part was, and what you can improve for the next rounds. For the evaluation, the work of the team, not of the team leader, is crucial.

And last, but not least, please be aware of one innovation. For your presentation during the final, your team would have ONLY a table or a school desk of approx. 100 x 150 cm in size (exact size will be given in the acceptance letter for the finalists) and the proximate surroundings of 10 cm around the table. You would not be able to use any additional space (walls, notice boards, floor behind the 10-cm radius), so keep this in mind when preparing your products.

Now you can start working, good luck with the tasks and enjoy the exploring!

Yours BEPPO 2019 Team

1. Creativity (20 %)

Beppo the Frog cleaned his pond and he found: 4 straws, 2 beverage cans, 2 PET bottles with lids, one meter of a string, 2 party balloons, 2 table-tennis balls, 2 corks, 4 skewers, 4 CDs, 4 plastic beverage cups and 4 ice cream sticks. That was a big cleaning!

In addition to these things, you have also 2 A4 sheets of office paper, and 2 A4 sheets of sturdy paper, scissors, knife, tape and a glue.

Using only the above-mentioned utilities (in maximum of the given amount) you can prepare one physical experiment, product, toy, or a model that you describe and draw or take a picture of and explain its physical principle.

Remember, you do not have to use all of Beppo's material, but you cannot use any additional or higher amount of the material than specified.

Keep your experiment, product, model, or toy you for an eventual presentation in the final of the competition.



Photo by author

2. Theory and research (30 %)

Beppo the Frog tried to sink down to the bottom of his pond to clean up all the rubbish. He was not successful, however, so he took the help of the debrouillards...

a) Give and describe at least three phenomena that you observe/feel during the dive to the bottom of the pond.

b) Return to the first part of this round (Creativity) and decide which items Beppo took from the bottom of the pond, which from of its surface, and fro which items both the two situations could occur (in this case, indicate when and why).

c) How deep was the pond, given that there was a water pressure of 630 N on the CD lying on the bottom of the pond? Calculate the CD dimensions from measurements.



Illustration by Jacques Goldstyn

3. Practice and project (50 %)

Make a physical product/toy/model or make an experiment demonstrating the behavior of bodies in the liquid.

Describe the material needed, describe also the creation of your product/model/toy/experiment, explain its principles or describe the experiment results, and add also your own photos or pictures.



Illustration by Zuzana Strankmüllerová

Describe the solution procedure of each task, the results of your team work, and any additional information, and document them with photos.

The solution can be handed in only before the deadline. Only the solutions fulfilling all the requisites given in the propositions will be judged.

If you have any questions, you can ask a category consultant in your country:

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