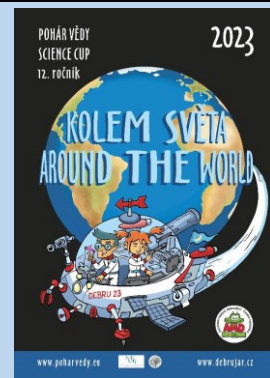


SCIENCE CUP – AROUND THE WORLD 2023



Category 2 – Primary School

3rd round – March – deadline 31. 3. 2022 23:59



Introduction

Dear competitors, thank you for all the great solutions of the 2nd round of the Science Cup - Around the World 2023, the trip to the Americas was very successful. Thank you all for the beautiful pictures and photos and thank the team leaders for the careful capture of your verbal descriptions. We liked very much the original posters with interesting information, we were impressed by your various boats and how much cargo they could carry, we admired your various high and stable towers as well as your measurements. Now the challenges of the third round await you as we head to Europe and before you start, get down to business, let's remind the most important information.

Solutions must be submitted no later than 23:59 on the last day of the round.

The solution must be uploaded to your category's Google Classroom by the required deadline as a single PDF file of no more than 10 MB in size. All contents of the file (text, sketches, photographs) must not exceed 3 A4 pages and be easily readable (simple font, minimum font size 11). In case you do not meet the deadline, format or scope of the work, your solution will be penalized with a loss of 20 points.

And finally, ONLY a table or bench of approximately 1 x 1.5 m in size and the surrounding area of 10 cm will be available to the team for their presentation of each round of the competition in the finals. No other space will possible to be used.

We look forward to your solutions for the second round.

Your Science Cup 2023 team - Jít'a H., Katka, Jít'a S., Nad'a, and David

1. Creative part (20 %)

The European continent and its islands are home to 46 independent states. 209 different languages from 6 language families are spoken here.

All countries except the Vatican are members of the United Nations; all countries except the Vatican, Belarus, Kazakhstan and Russia are members of the Council of Europe; and 27 countries are part of the EU.

Source: <https://cs.wikipedia.org/wiki/Evropa>



European flags and coats of arms are as varied as the European countries. Design a flag and coat of arms for your team and explain why you designed it how you did.

Since this is the third time we are meeting, we would like to know who is "hiding" under your original team names, so document your entire team in this round along with your flag and crest. We look forward to seeing photos of the teams with your flags and coat of arms.

2. Experimental part (40 %)

Your team has already demonstrated a lot of physics and chemistry skills. Even gastronomy is "physics and chemistry". Head to Greece, France, Italy, Sweden, Spain, Germany or the Czech Republic. Greece and Spain are among the largest producers of olives and olive oil, France boasts a worldwide reputation for products such as cheese and wine, Italy is famous for its pasta or tomato products, ...

Choose a team (cold = uncooked and unbaked) speciality typical for one of the European countries and prepare it for tasting. In case of advancing to the final, please take into account that due to the weather conditions and the chemicals on the stands, there will only be a demonstration and not a possible tasting.

Conduct a physics or chemistry experiment in which either an olive, grape, cheese, pasta, tomato, or a delicacy typical for the Czech Republic plays the main role. The other gadgets are entirely up to you this time, with the added bonus points to reward minimalism (0 - 2 other gadgets + 5 points 3 - 5 other gadgets +2 points, more than 5 gadgets 0 extra points). Describe the experiment and complement the description with your own pictures or photographs. Do not forget to list the tools and materials needed and quantify the number of them, evaluate how successful your experiment was and try to explain it.

You can take inspiration from the pictures:



<https://www.zsletohrad.cz/eu/fyzika/pokus19.htm>;

<https://kdf.mff.cuni.cz/hrastice/2021/mereni-spaget-a-makaronu-jaromir-blanka-a-sarka-kekulovi.pdf>

3. Practical part (40 %)



Germany is home to the largest roller coaster on the European continent: The Silver Star. The ride goes up to 72 metres and then sends visitors steeply falling almost to the ground.

Picture: <https://www.ervpojistovna.cz/cs/nejvetsi-horske-drahy>

Make a similar roller coaster for a marble or small car. You can use a few boxes, toilet paper rolls, PET bottles, cups, but also building blocks, in short, anything you can find. There are certainly no limits to your imagination. Attention! You must use at least 3 different types of building blocks for your track (e.g. Lego bricks, rolls, PET bottles, different building blocks). You can make troughs and turns out of hard paper. You can glue the track onto outside of boxes, but it can also go through the inside of the boxes to make the ball pop up again somewhere else and continue on. Picture: <https://helceletka.cz/krouzkuj-doma-kulickova-draha/> I'm sure you will discover a correlation between the slope of the track and the speed of the marble in your design work - let us know your findings. Can you include in your trajectory a loop in which it overcomes the earth's gravity? Make a loop out of hard paper, with the curved edges cut so that it can be curled, fix everything with glue. Measure the time it takes for the ball to travel through your path. The full number of points can only be scored by a team whose ball traverses the path for at least 4 seconds and at the same time the ball successfully passes through the loop.



Picture: Radek Chajda: Mladý technik 2, ISBN 978-80-266-0622-2

Document your experiments with photographs and pictures, and write everything down carefully. We suggest you make research diaries, in which you will write and draw everything. You will not send us the diaries, but if you are promoted to the finals, you will take them with you together with the products from the individual rounds.

Remember, however, that in order for us to be able to evaluate all your solutions, what you send us must not exceed three pages!

We are looking forward to your solutions and see you in the next round!

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 without any point loss.

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

Czech Republic: Jitka Houfková – jitka.houfkova@gmail.com and Kateřina Vágnerová – Katerina.Vagnerova@seznam.cz

Turkey: Basriye Öngel – basriye.korkmaz@gmail.com