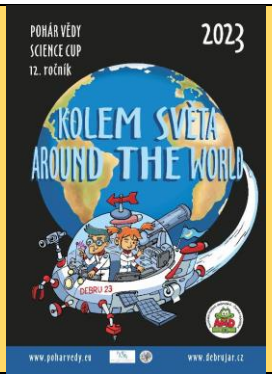
SCIENCE CUP – AROUND THE WORLD 2023

POHÁR VĚDY
SCIENCE CUP

Category 3 – Secondary School

2nd round – February – deadline 28. 2. 2023 23:59



Introduction

Dear competitors, thank you for all the great solutions of the 1st round of the Science Cup - Around the World 2023, the trip to Asia was very successful - we really liked the original fans, the elaborate origami, and the imaginative pictures made of paper on your own; we were also really excited about the original experiments, observations, and measurements with tea, spices and new materials. We did not expect such a storm of ideas. Now the challenges of the second round await you as we head to the Americas 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., Naďa, and David

1. Creative part (20 %)

Indian is the name given to the pre-Columbian indigenous ethnicities and peoples of North, Central and South America (excluding the Eskimos and Aleut) and their descendants.
Headdresses were a very important part of Indian decoration. Indians wore them as a symbol of power, headdresses were an essential part of dance ceremonies, and last but not least, they had a practical purpose. The form varied from region to region, their decoration and shape referring to important events or the bravery of the Indian.

Source: https://cs.wikipedia.org/wiki/Indi%C3%A1ni

Choose one of the following three creative team tasks offered, describe your process of making it and document your activity with your own pictures or photos.

- Your team is a bit like an Indian tribe, so make a team headdress and tell us why it is the way it is.
- Would you rather go to Mexico, which is famous for its sombreros? Then instead of a headdress, make your team hat and describe to us why it is just like that.
- Latin America is famous for its simple musical instruments. Making a simple musical instrument could be your third choice.

2. Experimental part (40 %)

Choose one experiment that would take you either to Mexico, Brazil or the USA.

Both Mexico and Brazil are among the largest producers of coffee and cocoa, and you will also go to Brazil for citrus fruits, and to Mexico for coconuts or corn.

Did you know that maize belongs to the grass family, along with rice, wheat, barley, sorghum and sugar cane? It was first cultivated in Mexico about 10,000 years ago. Since then, Mexicans have bred thousands of varieties suitable for the diverse types of Mexican landscape.

Mexico or Brazil - Make a physical or chemical experiment in which either coffee, cocoa, corn or citrus fruits play the main role. You can also choose another crop from Brazil or Mexico if you describe why it is typical of that country. You need to use at least one cup (glass/beaker) or plate (bowl) for your simple experiment with the food/plant. The other tools are up to you. Complete the experiment with your own pictures or photographs.

Source: J. Soukupova

The USA is one of the countries where many famous people in science and technology have lived and where many inventions, discoveries, and patents have been made. You can choose any of the famous American scientists and focus your experiment on one of their inventions, discoveries, laws or experiments. You can also use any of the American inventions/patents in your experiment.

In 1886 in Atlanta, USA, pharmacist and chemist John Pemberton was looking for a new way to make an analgesic to relieve his chest pain, which had persisted after an earlier injury. He mixed a liquid that contained, among other ingredients, the leaves of the South American coca tree and the kernels of kola nuts. He initially sold the drink as an undiluted syrup as a stimulant and a remedy for nausea or pain. Later, Pemberton began mixing the syrup with bubbling water and selling it as a refreshing drink. His accountant at the drugstore, Frank Robinson, named the drink Coca-Cola, and in his spare time designed the logo, which remains essentially unchanged till today.

USA - Choose a famous American physicist or chemist and implement a physical or chemistry experiment in which a substance or material he/she discovered or an experiment he/she designed plays a major role. You can also use any American invention or patent. However, again, you must use at least one cup (glass/beaker) or plate (bowl) and only simple tools to carry out the experiment.

List the tools used, the procedure and do not forget to explain the experiment. Also, tell us how your experiment relates to your chosen scientist or invention/patent. Support your experiment with your own pictures or photographs.

3. Practical part (40 %)

In the practical part we will combine theory, practice and observation or measurement.

We stay with Brazil, Mexico and the USA, as in the creative and experimental part. You can choose a typical delicacy, a famous scientist, a patent, but also perhaps an event typical for the country (Carnival in Brazil, US football, Día de la Bandera in Mexico,...). This time, however, you have three related tasks.

Depending on the choice of the main material or event for the practical part (corn, coffee, cocoa, citrus fruits, Coca-Cola, carnival …), which must be typical of the country:

- find out 3 interesting facts about the material or delicacy
- make and describe physical or chemical observations or measurements using the material/food (observe/measure volume, density, pH, determine the center of gravity, etc.)
- from your observations or measurements, draw correct conclusions



Sources: https://www.majkafe.cz/, https://www.jansochor.com/photo-blog/karneval-rio-de-janeiro-brazilie, photo J. Soukupová

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 and Slovakia: Jitka Soukupová – jitule.sk@seznam.cz and Naďa Zíková – zikova@icpf.cas.cz
Turkey: Basriye Öngel – basriye.korkmaz@gmail.com