Methodology of creating Books of Problems

ESA Contract No. 4000115691/15/NL/NDe

Increasing Space Motivation for Participants of National and International Science Olympiads

SPACEOLYMP

TABLE OF CONTENTS

I. Introduction

While preparing the Progress Report (Ref. No. 01-13-44 from August 1, 2016, p. 12-13), the Contractor has tried to explain that by creating Books of Problems some preparatory work was performed. Unfortunatelly there were no documentation prepared about the work which was fulfilled. It become obvious that there is the necessity of creation of separate document. The submission of Additional Explanatory Technical Note „Preparatory activities for Work Packages WP-SPOL 3; WP-SPOL 4; WP-SPOL 5; WP-SPOL 6; WP-SPOL 7; WP-SPOL 8; WP-SPOL 9“ was announced by Contractor. In this particular document the Contractor presented detailed description of:

- SPACEOLYMP symbol and logo to be used for project in all BoPs;
- website of project SPACEOLYMP;
- STEM-related SPACEOLYMP tables;
- STEM matrixes for different grades of relevant science subjects;
- BoP‘s coverpage and structure;
- problem‘s (task) content, question and answer to be used for project in all BoPs;
- Additional Space Guide for pupils during the project renamed into Space calendar;
- information sources and Catalogue of space events;
- specialized literature for different grades of relevant science subjects;
- various template forms of BoPs;
- space-promotional lectures for teachers at National Science Olympiads in Biology, Chemistry, Mathematics, Physics, Informatics and Astronomy;
- SPACEOLYMP presentation;
- Questionnaires for specialists of relevant science subjects;
- consent for participation in project activities of relevant science subjects;
- Questionnaires statistics overview;
- material of Workshop;

Finally, the Contractor has changed the title of Technical Note „Preparatory activities for Work Packages WP-SPOL 3; WP-SPOL 4; WP-SPOL 5; WP-SPOL 6; WP-SPOL 7; WP-SPOL 8; WP-SPOL 9“ into the title „Methodology for preparation of WP-SPOL 3 & D-SPOL 3, WP-SPOL 4 & D-SPOL 4, WP-SPOL 5 & D-SPOL 5, WP-SPOL 6 & D-SPOL 6, WP-SPOL 7 & D-SPOL 7, WP-SPOL 8 & D-SPOL 8 and WP-SPOL 9 & D-SPOL 9“.

II. Symbol and Logo of SPACEOLYMP

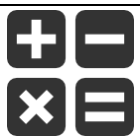
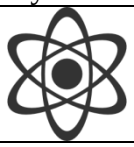
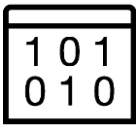
a) Symbol selection

First of all a pupil-friendly space-related open source picture as the project Symbol shall be selected:

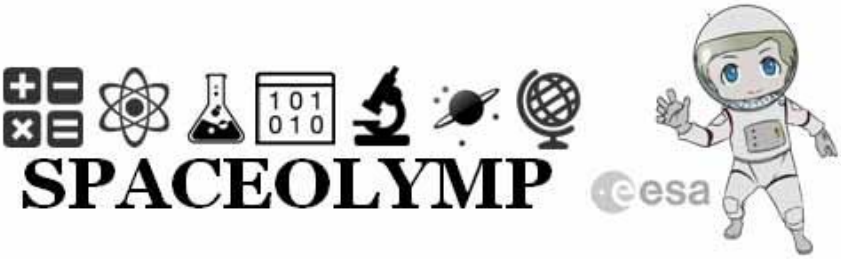
Let‘s name it „SPACEOLYMPian“ and it shall be used in all presentations, BoPs and websites.

b) Logo composition

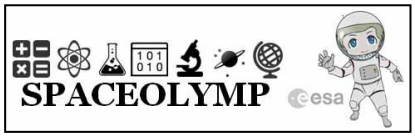
When constructing Logo of project SPACEOLYMP there were used open source graphic symbols for each BoP of science subjects:

Mathematics	Physics	Chemistry	Informatics	Biology	Astronomy	Geography
						

After selecting graphic symbols the image of „SPACEOLYMPian“, the logo of ESA and acronym SPACEOLYMP shall be combined into logo of project:



The Symbol and Logo shall be used in all presentations, BoPs and websites. The Logo shall be included in the Footer of each BoP‘s page with the size of 1,66 cm x 5,32 cm:



c) Website

Website of project SPACEOLYMP shall be uploaded in the following link:

http://lic.lt/projektai/vykdomi/spaceolymp/

By creating website with downloadable BoPs in lithuanian as well in english languages (both in MS Word *.docx and flipping book formats) was chosen the structure of it.

The Head of website (in lithuanian):

Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas

SPACEOLYMP

EKA sutartis Nr. 4000115691/15/NL/NDe

Sutikimas (mokytojų, specialistų, mokinių ir kt.) bendradarbiauti projekte SPACEOLYMP (užpildytą, pasirašytą ir nuskenuotą formą siųsti el. paštu - s.lapienis@lic.lt)
Projekto dalyvių bendradarbiavimas vyksta socialiniame tinkle FaceBook - https://www.facebook.com/SPACEOLYMP/

Translation and/or comments of the Head of website.

i) Title of project SPACEOLYMP in lithuanian:

Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas

ii) Logo of project SPACEOLYM:

SPACEOLYMP

iii) ESA‘s contract number (*in lithuanian*):

EKA sutartis Nr. 4000115691/15/NL/NDe

iv) Teacher‘s Consent for participation in SPACEOLYMP project and contact e-mail (downloadable form *in lithuanian*):

Sutikimas (mokytojų, specialistų, mokinių ir kt.) bendradarbiauti projekte SPACEOLYMP (užpildytą, pasirašytą ir nuskenuotą formą siųsti el. paštu - s.lapienis@lic.lt)

v) Possibility of participation in social network Facebook:

Projekto dalyvių bendradarbiavimas vyksta socialiniame tinkle FaceBook - https://www.facebook.com/SPACEOLYMP/

The Head of website (in english)

Increasing Space Motivation for Participants of National and International Science Olympiads
ESA contract No. 4000115691/15/NL/NDe

The Body of website (in lithuanian):

EKA 50: Matematika, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Matematika}$ prezentacija):
M (PDF) (pdf docx FL T) **8$_M$** (pdf docx FL T) **9$_M$** (pdf docx FL T) **10$_M$** (pdf docx FL T) **11$_M$** (pdf docx FL T) **12$_M$** (pdf docx FL T)
Atsiliepimai apie Matematikos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

EKA 50: Fizika, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Fizika}$ prezentacija):
F (PDF) (pdf docx FL T) **8$_F$** (pdf docx FL T) **9$_F$** (pdf docx FL T) **10$_F$** (pdf docx FL T) **11$_F$** (pdf docx FL T) **12$_F$** (pdf docx FL T)
Atsiliepimai apie Fizikos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

EKA 50: Chemija, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Chemija}$ prezentacija):
C (PDF) (pdf docx FL T) **8$_C$** (pdf docx FL T) **9$_C$** (pdf docx FL T) **10$_C$** (pdf docx FL T) **11$_C$** (pdf docx FL T) **12$_C$** (pdf docx FL T)
Atsiliepimai apie Chemijos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

EKA 50: Informatika, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Informatika}$ prezentacija)
I (PDF) (pdf docx FL T) **8$_I$** (pdf docx FL T) **9$_I$** (pdf docx FL T) **10$_I$** (pdf docx FL T) **11$_I$** (pdf docx FL T) **12$_I$** (pdf docx FL T)
Atsiliepimai apie Informatikos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

EKA 50: Biologija, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Biologija}$ prezentacija)
B (PDF) (pdf docx FL T) **8$_B$** (pdf docx FL T) **9$_B$** (pdf docx FL T) **10$_B$** (pdf docx FL T) **11$_B$** (pdf docx FL T) **12$_B$** (pdf docx FL T)
Atsiliepimai apie Biologijos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

EKA 50: Astronomija, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Astronomija}$ prezentacija)
A (PDF) (pdf docx FL T) **8$_A$** (pdf docx FL T) **9$_A$** (pdf docx FL T) **10$_A$** (pdf docx FL T) **11$_A$** (pdf docx FL T) **12$_A$** (pdf docx FL T)
Atsiliepimai apie Astronomijos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

EKA 50: Geografija, Kosmosas, Inovacijos (projekto SPACEOLYMP$_{Geografija}$ prezentacija)
G (PDF) (pdf docx FL T) **8$_G$** (pdf docx FL T) **9$_G$** (pdf docx FL T) **10$_G$** (pdf docx FL T) **11$_G$** (pdf docx FL T) **12$_G$** (pdf docx FL T)
Atsiliepimai apie Geografijos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

Translation and/or comments of the Body of website.

i) Downloadable *presentation* of SPACEOLYMP$_{Science\ subject}$

(projekto SPACEOLYMP$_{Mokslo\ sritis}$ prezentacija)

ii) Downloadable *Questionairy* about the BoP in Mathematics“, pls send by e-mail).

Atsiliepimai apie matematikos uždavinyną (užpildytą formą siųsti puslapio viršuje nurodytu el. paštu)

The Body of website (in english):

ESA 50: Mathematics, Space, Innovation

M (PDF) (pdf docx FL T) **8**$_M$ (pdf docx FL T) **9**$_M$ (pdf docx FL T) **10**$_M$ (pdf docx FL T) **11**$_M$ (pdf docx FL T) **12**$_M$ (pdf docx FL T)

ESA 50: Physics, Space, Innovation

P (PDF) (pdf docx FL T) **8**$_P$ (pdf docx FL T) **9**$_P$ (pdf docx FL T) **10**$_P$ (pdf docx FL T) **11**$_P$ (pdf docx FL T) **12**$_P$ (pdf docx FL T)

ESA 50: Chemistry, Space, Innovation

C (PDF) (pdf docx FL T) **8**$_C$ (pdf docx FL T) **9**$_C$ (pdf docx FL T) **10**$_C$ (pdf docx FL T) **11**$_C$ (pdf docx FL T) **12**$_C$ (pdf docx FL T)

ESA 50: Informatics, Space, Innovation

I (PDF) (pdf docx FL T) **8**$_I$ (pdf docx FL T) **9**$_I$ (pdf docx FL T) **10**$_I$ (pdf docx FL T) **11**$_I$ (pdf docx FL T) **12**$_I$ (pdf docx FL T)

ESA 50: Biology, Space, Innovation

B (PDF) (pdf docx FL T) **8**$_B$ (pdf docx FL T) **9**$_B$ (pdf docx FL T) **10**$_B$ (pdf docx FL T) **11**$_B$ (pdf docx FL T) **12**$_B$ (pdf docx FL T)

ESA 50: Astronomy, Space, Innovation

A (PDF) (pdf docx FL T) **8**$_A$ (pdf docx FL T) **9**$_A$ (pdf docx FL T) **10**$_A$ (pdf docx FL T) **11**$_A$ (pdf docx FL T) **12**$_A$ (pdf docx FL T)

ESA 50: Geography, Space, Innovation

G (PDF) (pdf docx FL T) **8**$_G$ (pdf docx FL T) **9**$_G$ (pdf docx FL T) **10**$_G$ (pdf docx FL T) **11**$_G$ (pdf docx FL T) **12**$_G$ (pdf docx FL T)

Pastabos ir žymėjimai (in lithuanian)

* 1) šalia raidžių M, arba F, arba C, arba I , arba B, arba A, arba G skliausteliuose:
– PDF – skirtingai nuspalvintos ir paryškintos „pdf“ formato bylos yra Uždavinynai parengti pagal EKA sutartį Nr. 4000115691/15/NL/NDe, kur M yra Matematika, F – Fizika, C – Chemija, I – Informatika, B – Biologija, A – Astronomija, G – Geografija;
– pdf – uždavinynas sudarytas pagal EKA sutartį Nr. 4000115691/15/NL/NDe;
– docx – pagal EKA sutartį Nr. 4000115691/15/NL/NDe parengto Uždavinyno Microsoft Word dokumentas;
– FL – pagal EKA sutartį Nr. 4000115691/15/NL/NDe parengto Uždavinyno „flip“ tipo dokumentas arba virtualiai vartoma knyga (lengvai įkraunama į išmaniuosius telefonus);
– T – atitinkamos mokslo srities Uždavinyno šablonas, Word dokumentas docx;
2) N$_s$ (pdf docx FL T) yra parsisiunčiami N klasės „s“ mokslo srities įvairaus formato uždavinynai arba jų šablonai, kur:
N = 8, arba 9, arba 10, arba 11, arba 12, arba uždavinynai skirti 8, 9, 10, 11, 12 klasėms atitinkamai;
„s“ = M, arba F, arba C, arba I, arba B, arba A, arba G;
– pdf – atitinkamos mokslo srities ir atitinkamos klasės Uždavinynas, pateikiamas pdf formatu;
– docx – atitinkamos mokslo srities ir atitinkamos klasės Uždavinynas, Microsoft Word dokumentas;
– FL – atitinkamos mokslo srities ir atitinkamos klasės Uždavinynas pateikiamas kaip „flip“ tipo dokumentas arba virtualiai vartoma knyga (lengvai įkraunama į išmaniuosius telefonus);
– T – atitinkamos mokslo srities ir atitinkamos klasės Uždavinyno šablonas, pateikiamas Microsoft Word docx formatu;
QR kodų lentelė – SPACEOLYMP projekto 7 mokslo sričių ir 8, 9, 10, 11 ir 12 klasių Uždavinynų šablonai, pateikiami kaip „flip“ tipo virtualiai vartomos knygos;
PASTABA: kai uždavinynai bus pateikti viešam naudojimui, ***raudonos spalvos įrašai esantys N$_s$ skliausteliuose bus pakeisti juodos spalvos įrašais*** ir turės įterptas atitinkamas nuorodas.

The remarks and marking (in english)

** 1) In parentheses next to the letters M, or P, or C, or I, or B, or A, or G:
– PDF – differently colored and highlighted “pdf” files are downloadable Books of Problems (BoP) created under the Contract No. 4000115691/15/NL/NDe, where M is Mathematics, P – Physics, C – Chemistry, I – Informatics, B – Biology, A – Astronomy, G – Geography;
– pdf – downloadable BoP created under the Contract No. 4000115691/15/NL/NDe;
– docx – downloadable Microsoft Word document, created BoP under the Contract No. 4000115691/15/NL/NDe;
– FL – downloadable “flip” book, easy readable on smart phones, created BoP under the Contract No. 4000115691/15/NL/NDe;
– T – downloadable and self-formable BoP templates of relevant science object, Microsoft Word document in docx format;
2) N$_s$ (pdf docx FL T) are downloadable BoP’s or their relevant templates of grade N from science object “s” created in various formats, where:
N = 8, or 9, or 10, or 11, or 12 are BoP’s for grades 8, 9, 10, 11, 12 accordingly;
“s” = M, or F, or C, or I, or B, or A, or G;
– pdf – downloadable BoPs of relevant science object and grade, presented in pdf format;
– docx – downloadable BoPs of relevant science object and grade, Microsoft Word document;
– FL – downloadable BoPs of relevant science object and grade, presented as “flip” book, easy readable on smart phones;
– T – downloadable and self-formable BoP template of relevant science object and grade, presented in Microsoft Word docx format;
Table of QR codes – promotional templates of BoP’s in project SPACEOLYMP of all 7 science objects and grades 8, 9, 10, 11, 12 are presented as “flip” books, easy reachable by smart phones;

General notice: when english version of BoPs will be available for public use, the ***red colored notes in N$_s$ shall be replaced by black color*** and shall have the appropriate downloadable links.

III. STEM-related „SPACEOLYMP table“

Contractor‘s team made decision to create STEM-related „SPACEOLYMP table“ consisting of specially constituted blocks. The blocks should include a variety of Concepts (Terms) such as Space bodies, science subjects, recently developed Google tools (Earth, Mars, Sky), historical facts, Space exploration tools, properties, phenomena, Space agencies, physical dimensions, origins of Lithuania (where it possible).

There were selected structure and content of following blocks:

Block A - Space bodies, the most understood for teachers and pupils:

- Earth;
- Moon;
- Mars;
- planet (any planet of Solar system or Universe);
- Sun;
- comet;
- asteroide;
- meteorite (meteoroid);

Block B – Science objects, the same as the topics in project SPACEOLYMP:

- mathematics;
- physics;
- chemistry;
- informatics;
- biology;
- astronomy;
- geography;

Block C – preferably used all three categories (included in textual part of problem):

- innovativeness;
- engineering;
- technology transfer;

Block D – Google mapping instruments (optional):

- Google Earth;
- Google Moon;
- Google Mars;
- Google Sky;

Block E – preferably/optional selection of historical events;

Block F – Space exploration subjects (objects) and tools:

- telescope;
- astronaut;
- robot;
- rocket;

- shuttle;
- ISS;
- cubesat;
- satellite;
- rover;
- probe;

Block G – space properties and phenomena:

- temperature;
- mass;
- gravity;
- atmosphere;
- frequency;
- radiation;
- wave;
- magnetism;

Block H – world‘s largest and leading Space agencies:

- NASA (USA);
- ESA (European Union);
- Roscosmos (Russia, including former Soviet Union);
- JAXA (Japan);
- CNSA (China);
- ISRO (India);
- CNES (France);
- DLR (Germany);

Block I – physical dimensions and etc.:

- time;
- period;
- angle;
- coordinate;
- trajectory;
- orbit;
- distance;
- velocity;

Block J* – science subjects, they are the same as SPACEOLYMP‘s science subjects, Block B:

- mathematics;
- physics;
- chemistry;
- informatics;
- biology;
- astronomy;
- geography;

* in order to initiate/inspire/develope STEM knowledge, activities and thinking the 6 (six) science subjects which don‘t coincide with the Block‘s B science subjects shall be used by combining the pairs

of them in each Problem of each BoP. For example, in case of BoP in Mathematics the following pairs shall be used:

Mathematics + Physics,
Mathematics + Chemistry,
Mathematics + Informatics,
Mathematics + Biology,
Mathematics + Astronomy,
Mathematics + Geography,

in case of BoP in Physics other pairs shall be used:

Physics + Mathematics,
Physics + Chemistry,
Physics + Informatics,
Physics + Biology,
Physics + Astronomy,
Physics + Geography,

in case of BoP in Chemistry yet another pairs shall be used:

Chemistry + Mathematics,
Chemistry + Physics,
Chemistry + Informatics,
Chemistry + Biology,
Chemistry + Astronomy,
Chemistry + Geography,

and so on. Of course, here is chosen the simplest case, when to science subjects are included in problems texts/questions. The more advanced cases would be when using trios of them, for example:

Mathematics + Physics + Chemistry,
Mathematics + Physics + Informatics,
Mathematics + Physics + Biology,
Mathematics + Physics + Astronomy,
Mathematics + Physics + Geography.

As the top level of STEM-related background by creating problems could be the case when all subjects are used at once:

Mathematics + Physics + Chemistry + Informatics + Biology + Astronomy + Geography

The appropriate example of last combination exist in the scenes of science fiction movie „Martian“.

Block K – optionally selected events and activities from Lithuania‘s space history.

Finally the following STEM-related „SPACEOLYMP table“ could be constructed:

A		LIC - SPACEOLYMP - ESA						D
	Earth / Sun	B			C		GOOGLE Earth	
	Moon / Comet	Mathematics	Physics	Chemistry	Innovativeness		GOOGLE Moon	
	Mars / Asteroide	Informatics	Biology	Astronomy	Engineering		GOOGLE Mars	
	Planet / Meteorite		Geography		Technology transfer		GOOGLE Sky	
K	Lithuanians	8 (Q/A)	9 (Q/A)	10 (Q/A)	11 (Q/A)	12 (Q/A)	Historical facts	E
J		Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope	F
	Mathematics	Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut	
	Physics	Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot	
	Chemistry	Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket	
	Informatics	Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle	
	Biology	Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS	
	Astronomy	Problem 7	Problem 17	Problem 27	Problem 37	Problem 47	Cubesat	
	Geography	Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite	
		Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover	
		Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe	
I	Time / Period / Angle / Coordinate / Trajectory / Orbit / Distance / Velocity	NASA / ESA / Roscosmos / JAXA / CNSA / ISRO / CNES / DLR					Temperature / Mass / Gravity / Atmosphere / Frequency / Radiation / Wave / Magnetism	G
		H						

Notice: hereinabove table is associated with BoP in Mathematics.

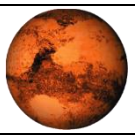
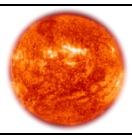
The combination of different Concepts (Terms) from each block constitutes sufficient circumstances for creating STEM-related problems (tasks). It is easy to obtain that from all blocks A, B, C, D, E, F, G, H, I, J, K could be constructed the quantity of 20643840 (8 x 7 x 3 x 4 x 1 x 10 x 8 x 8 x 8 x 6 x 1) problems (tasks) or 412876 Books of Problems (BoPs) consisting of 50 tasks. Such an impressive amount of problems for sure could cover a giant knowledge area in Space science and technologies. Seeking to formalize and simplify the algorithm of BoP construction, and reduction of their amount there was chosen „know-how“ design way of construction of personalized recurrent arrays of each problem. It was assumed that concepts from blocks C, D, E and K could be used optionally.

In the Internet the open source pictures shall be found which corresponds to various Concepts (Terms) of „SPACEOLYMP table“:

- for **Block A** (Space bodies)

A	Earth	Sun
	Moon	Comet
	Mars	Asteroide
	Planet	Meteorite

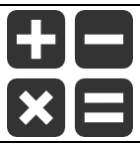
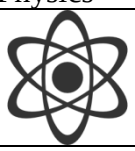
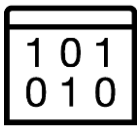
they are:

Earth	Moon	Mars	Planet	Sun	Comet	Asteroid	Meteorite
							

- for **Block B** (science subjects)

B		
Mathematics	Physics	Chemistry
Informatics	Biology	Astronomy
	Geography	

they are:

Mathematics	Physics	Chemistry	Informatics	Biology	Astronomy	Geography
						

- **Block C**

C
Innovativeness
Engineering
Technology transfer

will be presented in the content of BoPs;

- **Block D**

GOOGLE Earth
GOOGLE Moon
GOOGLE Mars
GOOGLE Sky

is optional;

- **Block E**

Historical facts	**E**

will be presented (if possible) in the content of BoPs;

- for **Block F** (Space exploration tools)

Telescope
Astronaut
Robot
Rocket
Shuttle
ISS
Cubesat
Satellite
Rover
Probe

F

they are:

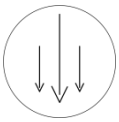
Telescope	Astronaut	Robot	Rocket	Shuttle
				
ISS	Cubesat	Satellite	Rover	Probe
				

- for **Block G** (properties, phenomenon and etc.)

Temperature
Mass
Gravity
Atmosphere
Frequency
Radiation
Wave
Magnetism

G

they are:

Temperature	Mass	Gravity	Atmosphere	Frequency	Radiation	Wave	Magnetism
							

- for **Block H** (Space agencies)

NASA
ESA
Roscosmos
JAXA
CNSA
ISRO
CNES
DLR
H

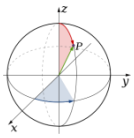
they are:

NASA	ESA	Roscosmos	JAXA	CNSA	ISRO	CNES	DLR

- for **Block I** (physical dimensions and etc.)

Time
Period
Angle
Coordinate
Trajectory
Orbit
Distance
Velocity
I

they are:

Time	Period	Angle	Coordinate	Trajectory	Orbit	Distance	Velocity
							

- **<u>Block J</u>**

J	Mathematics Physics Chemistry Informatics Biology Astronomy Geography

shall be used for creating STEM-related science subject combinations;

- **<u>Block K</u>**

K	**Lithuanians**

the suitable information will be presented (if possible) in the content of BoPs.

IV. Structure of Book of Problem (BoP)

The following scheme of BoP construction shall be used:

Cover page

⇩

CONTENT

⇩

STEM matrix

⇩

Problem No.

⇩

Descriptive part of the Problem

⇩

Illustration of the Problem

⇩

Space calendar

⇩

Answer

⇩

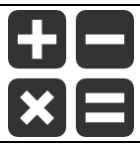
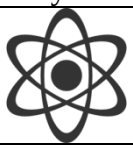
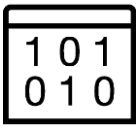
INFORMATION SOURCE

⇩

Vocabulary

a) Cover page

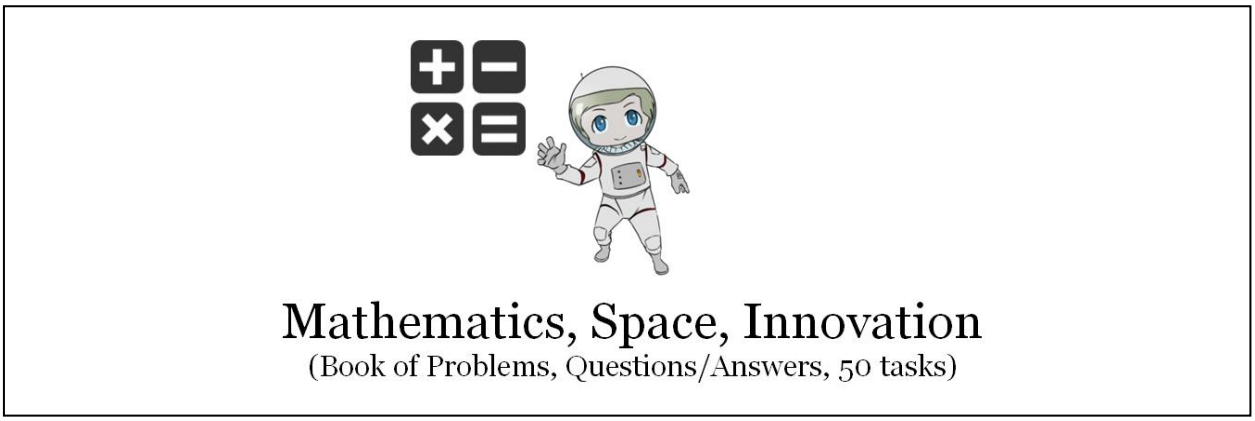
By constructing Cover page of each BoP the symbol of „SPACEOLYMPian“ shall be combined with the symbol of appropriate science subject from the table (see hereinbellow):

Mathematics	Physics	Chemistry	Informatics	Biology	Astronomy	Geography
						

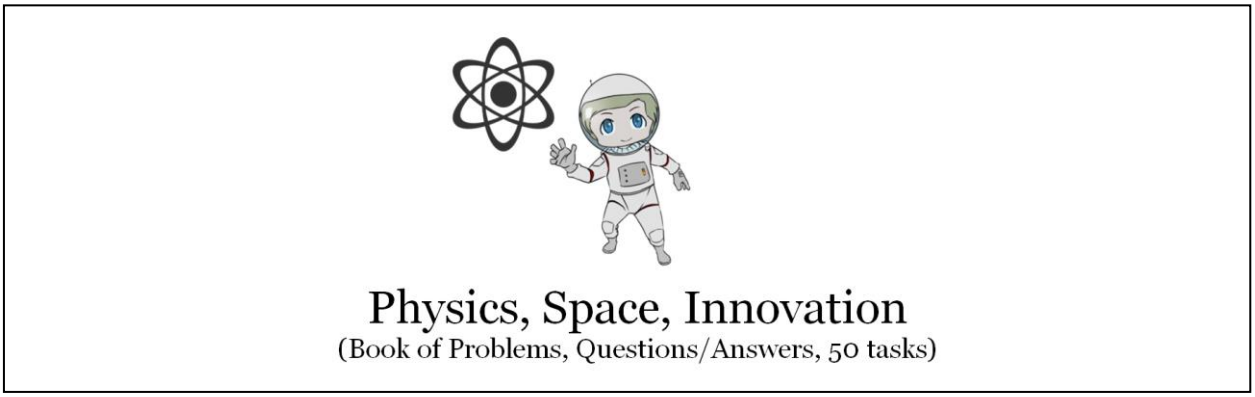
and the titles of BoPs.

By using the hereinabove science subject symbols were prepared 7 (seven) images of Cover pages for BoPs:

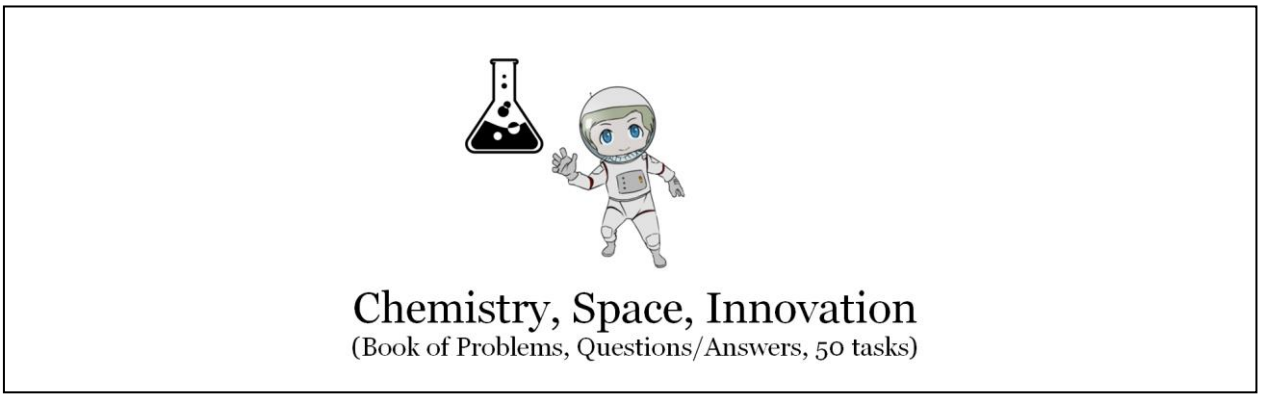
- in Mathematics



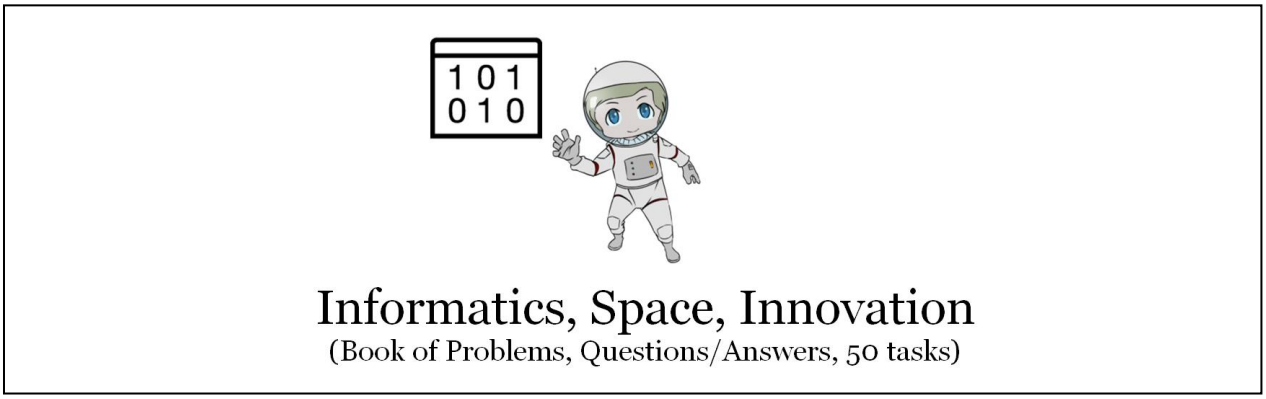
- in Physics



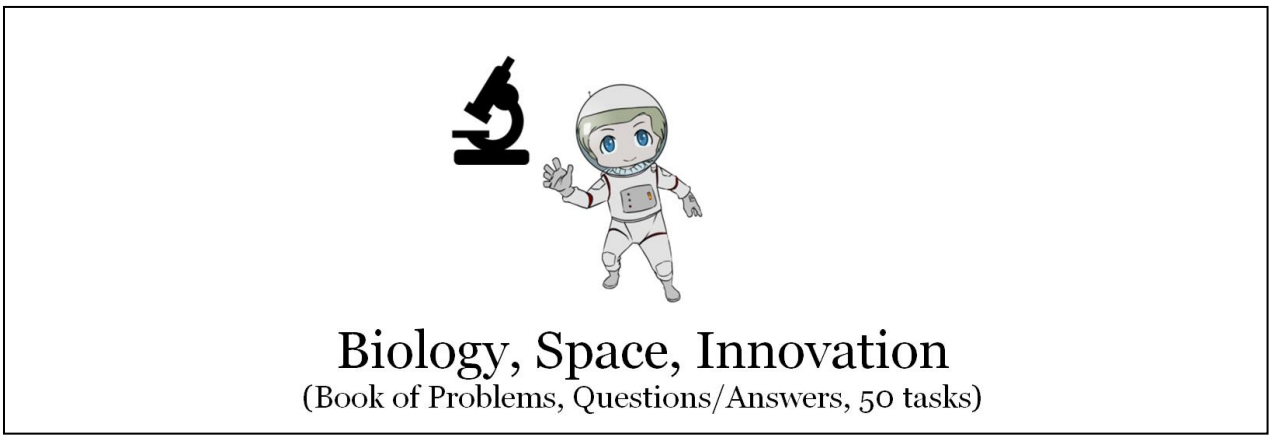
- in Chemistry



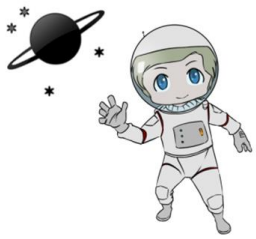
- in Informatics



- in Biology



- in Astronomy



Astronomy, Space, Innovation
(Book of Problems, Questions/Answers, 50 tasks)

- in Geography

Geography, Space, Innovation
(Book of Problems, Questions/Answers, 50 tasks)

Following to accepted decision to use the universal time in all textual parts of BoPs as the main time measurement, the specific inscription at the bottom of each BoP‘s cover page shall be required:

All time values in Book of Problems are indicated as UTC (Coordinated Universal Time)

b) Structure of Content

There was taken the decision to present the unified Content for all BoPs. The coding and numbering of Problems shall be solved by using the first capital letter of corresponding science subject.

Each Problem in different grades of each BoP shall be coded and numbered in the following way:

science subjects are coded as x;

problems for 8th grade of science subject x are coded as x-8;

1st problem of 8th grade of science subject x is coded as x-8.1;

2nd problem of 8th grade of science subject x is coded as x-8.2 and so on.

Overall numbering of Problems inside each BoP has consequently increasing numbering:

x-8.1 have to be numbered as „Problem No. 1“;

x-8.2 have to be numbered as „Problem No. 2“ and so on;

...

x-12.1 have to be numbered as „Problem No. 41“;

...

x-12.10 – as „Problem No. 50“.

The variable x presented hereinabove could take the following values:

x = M, for BoP in Matehmatics;

x = P, for BoP in Physics (in lithuanian version letter P must be replaced by F, Fizika);

x = C, for BoP in Chemistry;

x = I, for BoP in Informatics;

x = B, for BoP in Biology;

x = A, for BoP in Astronomy;

x = G, for BoP in Geography.

At the same time direct access from the Content‘s records to Problems shall be implemented via appropriate bookmarks. All the fonts used in the Content shall be „Georgia“ with the size „12“.

Finally the structure of Content of each BoP shall be following (text only with grey background):

CONTENT
FOREWORD ..... F (“F” *have inserted hyperlink to bookmark of Foreword*)
Grade 8 (“Grade 8” have inserted hyperlink to bookmark of Grade 8 with 10 problems)
x-8.1 ..... 8.1 (8.1 *have inserted hyperlink to bookmark of Problem No. 1*)
x-8.2 ..... 8.2 (8.2 *have inserted hyperlink to bookmark of Problem No. 2*)
x-8.3 ..... 8.3 (8.3 *have inserted hyperlink to bookmark of Problem No. 3*)
x-8.4 ..... 8.4 (8.4 *have inserted hyperlink to bookmark of Problem No. 4*)
x-8.5 ..... 8.5 (8.5 *have inserted hyperlink to bookmark of Problem No. 5*)
x-8.6 ..... 8.6 (8.6 *have inserted hyperlink to bookmark of Problem No. 6*)
x-8.7 ..... 8.7 (8.7 *have inserted hyperlink to bookmark of Problem No. 7*)
x-8.8 ..... 8.8 (8.8 *have inserted hyperlink to bookmark of Problem No. 8*)
x-8.9 ..... 8.9 (8.9 *have inserted hyperlink to bookmark of Problem No. 9*)
x-8.10 ..... 8.10 (8.10 *have inserted hyperlink to bookmark of Problem No.10*)

Grade 9 ("Grade 9" have inserted hyperlink to bookmark of Grade 9 with 10 problems)

x-9.1 ..... 9.1 (9.1 *have inserted hyperlink to bookmark of Problem No. 11*)

x-9.2 ..... 9.2 (9.2 *have inserted hyperlink to bookmark of Problem No. 12*)

x-9.3 ..... 9.3 (9.3 *have inserted hyperlink to bookmark of Problem No. 13*)

x-9.4 ..... 9.4 (9.4 *have inserted hyperlink to bookmark of Problem No. 14*)

x-9.5 ..... 9.5 (9.5 *have inserted hyperlink to bookmark of Problem No. 15*)

x-9.6 ..... 9.6 (9.6 *have inserted hyperlink to bookmark of Problem No. 16*)

x-9.7 ..... 9.7 (9.7 *have inserted hyperlink to bookmark of Problem No. 17*)

x-9.8 ..... 9.8 (9.8 *have inserted hyperlink to bookmark of Problem No. 18*)

x-9.9 ..... 9.9 (9.9 *have inserted hyperlink to bookmark of Problem No. 19*)

x-9.10 ..... 9.10 (9.10 *have inserted hyperlink to bookmark of Problem No.20*)

Grade 10 ("Grade 10" have inserted hyperlink to bookmark of Grade 10 with 10 problems)

x-10.1 ..... 10.1 (10.1 *have inserted hyperlink to bookmark of Problem No.21*)

x-10.2 ..... 10.2 (10.2 *have inserted hyperlink to bookmark of Problem No.22*)

x-10.3 ..... 10.3 (10.3 *have inserted hyperlink to bookmark of Problem No.23*)

x-10.4 ..... 10.4 (10.4 *have inserted hyperlink to bookmark of Problem No.24*)

x-10.5 ..... 10.5 (10.5 *have inserted hyperlink to bookmark of Problem No.25*)

x-10.6 ..... 10.6 (10.6 *have inserted hyperlink to bookmark of Problem No.26*)

x-10.7 ..... 10.7 (10.7 *have inserted hyperlink to bookmark of Problem No.27*)

x-10.8 ..... 10.8 (10.8 *have inserted hyperlink to bookmark of Problem No.28*)

x-10.9 ..... 10.9 (10.9 *have inserted hyperlink to bookmark of Problem No.29*)

x-10.10 ..... 10.10 (10.10 *have inserted hyperlink to bookmark of Problem No.30*)

Grade 11 ("Grade 11" have inserted hyperlink to bookmark of Grade 11 with 10 problems)

x-11.1 ..... 11.1 (11.1 *have inserted hyperlink to bookmark of Problem No.31*)

x-11.2 ..... 11.2 (11.2 *have inserted hyperlink to bookmark of Problem No.32*)

x-11.3 ..... 11.3 (11.3 *have inserted hyperlink to bookmark of Problem No.33*)

x-11.4 ..... 11.4 (11.4 *have inserted hyperlink to bookmark of Problem No.34*)

x-11.5 ..... 11.5 (11.5 *have inserted hyperlink to bookmark of Problem No.35*)

x-11.6 ..... 11.6 (11.6 *have inserted hyperlink to bookmark of Problem No.36*)

x-11.7 ..... 11.7 (11.7 *have inserted hyperlink to bookmark of Problem No.37*)

x-11.8 ..... 11.8 (11.8 *have inserted hyperlink to bookmark of Problem No.38*)

x-11.9 ..... 11.9 (11.9 *have inserted hyperlink to bookmark of Problem No.39*)

x-11.10 ..... 11.10 (11.10 *have inserted hyperlink to bookmark of Problem No.40*)

Grade 12 ("Grade 12" have inserted hyperlink to bookmark of Grade 12 with 10 problems)

x-12.1 ..... 12.1 (12.1 *have inserted hyperlink to bookmark of Problem No.41*)

x-12.2 ..... 12.2 (12.2 *have inserted hyperlink to bookmark of Problem No.42*)

x-12.3 ..... 12.3 (12.3 *have inserted hyperlink to bookmark of Problem No.43*)

x-12.4 ..... 12.4 (12.4 *have inserted hyperlink to bookmark of Problem No.44*)

x-12.5 ..... 12.5 (12.5 *have inserted hyperlink to bookmark of Problem No.45*)

x-12.6 ..... 12.6 (12.6 *have inserted hyperlink to bookmark of Problem No.46*)

x-12.7 ..... 12.7 (12.7 *have inserted hyperlink to bookmark of Problem No.47*)

x-12.8 ..... 12.8 (12.8 *have inserted hyperlink to bookmark of Problem No.48*)

x-12.9 ..... 12.9 (12.9 *have inserted hyperlink to bookmark of Problem No.49*)

x-12.10 ..... 12.10 (12.10 *have inserted hyperlink to bookmark of Problem No.50*)

Answers ..... A („A" *have inserted hyperlink to bookmark of Answers*)

Information source ..... Info („Info" *have inserted hyperlink to bookmark of Information source*)

Vocabulary ..... V („V" *have inserted hyperlink to bookmark of Vocabulary*)

Notice: all records presented in the grey background are obligatory for each BoP, but other records has only explanatory manner and shall be removed from original BoPs.

c) STEM matrix

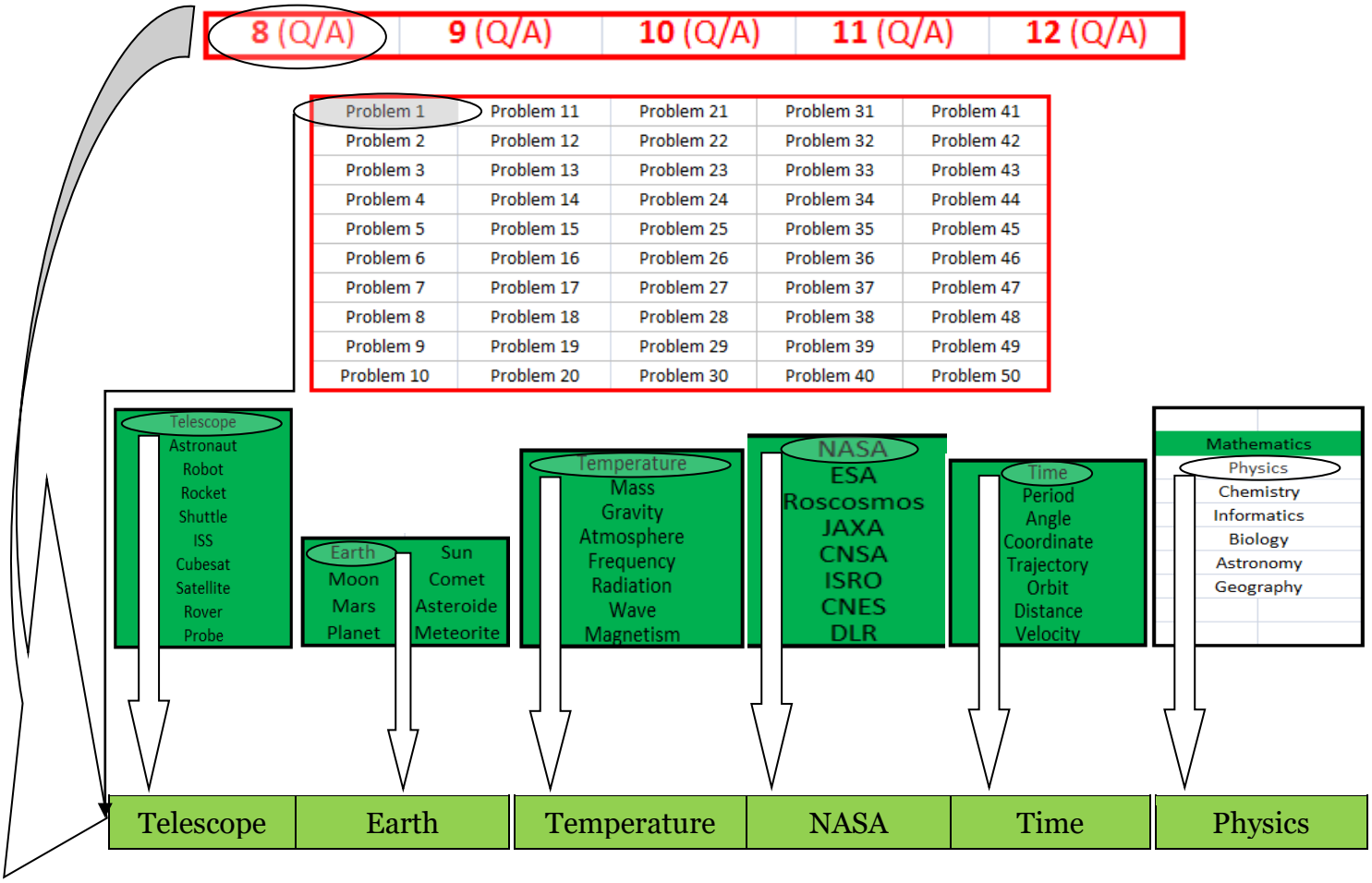
First of all the assignement of different colors for Space bodies (see III., Block A) of „SPACEOLYMP table" shall be applied:

- Earth's cell will be of *green color*;
- Moon's cell will be of *grey color*;
- Mars's cell will be of *brown color*;
- Planet's cell will be of *blue color*;
- Sun's cell will be of *yellow color*;
- Comet's cell will be of *pink color*;
- Asteroide's cell will be of *mint color*;
- Meteorite's cell will be of *gold color*;

Separatelly the Rover's cell shall be of *red color* and the Probe's cell shall be of *yellow color*.

The consequent decission was made by creating „STEM matrixes". This rule of colored „STEM matrix's" cells shall be applied to all Books of Problems.

The special construction scheme of one row from 8th grade, Problem No. 1 shall be applied:



The same construction procedure shall be appliek for second row of „STEM matrix“, and so on.

For each grade of each BoP the *know-how* „STEM matrix“ shall be given (for 10 Problems). For example, „STEM matrix“ for 10 (ten) problems of Grade 8 in the BoP in Mathematics shall look like:

Telescope	Earth	Temperature	NASA	Time	Physics	STEM
Astronaut	Moon	Mass	ESA	Period	Chemistry	
Robot	Mars	Gravity	Roscosmos	Angle	Informatics	
Rocket	Planet	Atmosphere	JAXA	Coordinate	Biology	
Shuttle	Sun	Frequency	CNSA	Trajectory	Astronomy	
ISS	Comet	Radiation	ISRO	Orbit	Geography	
Cubesat	Asteroide	Wave	CNES	Distance	Physics	
Satellite	Meteorite	Magnetism	DLR	Velocity	Chemistry	
Rover	Earth	Temperature	ESA	Period	Informatics	
Probe	Moon	Mass	Roscosmos	Angle	Biology	

In the project SPACEOLYMP shall be constructed 35 (thirty five) such „STEM matrixes“ (7 BoPs multiplied to 5 grades in each BoP). For each Problem shall be assigned the unique row from „STEM matrix“ never repeating in all BoPs of SPACEOLYMP project. The „STEM matrixes“ of different science subjects are contained in the Annexes M, P, C, I, B, A and G.

d) Structure of Problem

Each Problem starts with some short decription which contains historical-technical information. Questions shall be situated after description, and there is the sign „A“ with embedded direct link to appropriate answer. Answers are presented at the end of each BoP.

Each answer has embedded direct reverse bookmark to its appropriate question (sign „Q“).

Each description, if possible, contains the open source picture or the picture with appropriate reference to the source respectively.

Each question, if necessary, contains appropriate drawings, diagrams, charts, tables and etc.

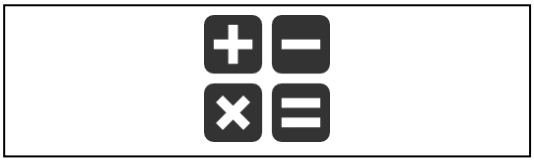
In front of each new grade‘s set of Problems the adequate page of grade shall be created consisting of: science subject sign; text „Grade“ with corresponding number of particular grade ***written in bolded „Georgia“ font*** of „48“ size; corresponding „STEM matrix“ of the grade.

For example, in case of 10th grade at BoP in Mathematics this should look like:

Grade 10

Telescope	Moon	Frequency	ESA	Distance	Informatics	STEM
Astronaut	Mars	Radiation	Roscosmos	Velocity	Biology	
Robot	Earth	Wave	JAXA	Time	Astronomy	
Rocket	Moon	Magnetism	CNSA	Period	Geography	
Shuttle	Mars	Temperature	ISRO	Coordinate	Physics	
ISS	Planet	Mass	CNES	Trajectory	Chemistry	
Cubesat	Sun	Gravity	DLR	Orbit	Informatics	
Satellite	Comet	Atmosphere	NASA	Distance	Biology	
Rover	Asteroide	Frequency	ESA	Velocity	Astronomy	
Probe	Meteorite	Radiation	Roscosmos	Time	Geography	

- in order to distinguish visually problems from each other before each problem *in the middle of text line the symbol of corresponding science subject shall be inserted*, eg. in case of BoP in Mathematics symbol of math shall be inserted:

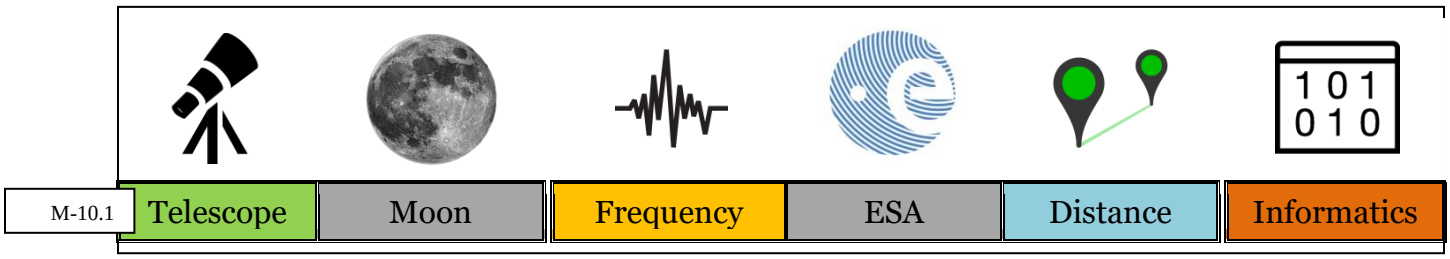


- bellow the inserted science symbol *in the left side of text page the encrypted problem's serial number shall be recorded*, eg.:

M-10.1 – **Problem No. 21**

here „M-10.1" is problem's code, where „M" refers to the science subject „Mathematics", „10" refers to the tenth grade, „1" means the serial number of problem in the tenth grade, and alongside code of Problem ***in bold font*** *the serial number* „**Problem No. 21**" *shall be recorded*. Each BoP numbering starts from 1 and continue until 50.

- after each consecutively coded number of Problem *the combined table of pictures and concepts (terms) shall be provided*, consisting of the row with colored cells and records inside taken from „STEM matrix" (see IV d)), and above it the images corresponding to the records incripted inside colored cells shall be applied. Further, the next consequent row from the „STEM matrix" of the same grade of the same science subject shall be used by creating next Problem. First row of „STEM matrix" corresponds to the first Problem, second row of „STEM matrix" corresponds to the second Problem and so on. Eg., hereinbellow displayed table *in the center of the text page* shall correspond to coded Problem „M-10.1 – **Problem No. 21"**:



- each table with combined pictures and concepts (terms) *shall be followed by the descriptive part of Problem*. This part can include (optionally) various physical dimensions, values, drawings necessary for formulation of Questions of Problems. All the names of subjects (rockets, satellites, missions and etc.) and their abbrevations in Lithuanian BoP version shall be written between guotes, and in English version – *in italic*. In Lithuanian version of BoPs can be used the terms and

explanations in English, which shall be written in italics and between brackets. The text of descriptive part of the Problem shall be presented in regular „Georgia“ font, with a size „12“ and line spacing – „1,5 lines“.

The text example of descriptive part of the Problem is presented bellow:

In the Spanish island of Tenerife at the sea level of 2400 m the ESA‘s Optical ground Station is functioning. In 2001 in the station has been installed the Space Debris Telescope of European Space Agency. Space debris is calculated once per month. This is done during every New moon by directing the telesescope towards very center of the Moon. At this moment only the Earth illuminates the Lunar disk, on which is observed any debris of 10 cm in diameter revolving inside the geostationary ring. Geostacionary ring is the Space segment located 75 km below and 75 km above the geostacionary orbit and between -15 and +15 degrees of declination. In astronomy declination is one of the two equatorial coordinate system’s coordinates.

October 18, 2013 is a historic day, because it could be considered as the foundation Day of the Interplanetary Internet. This day NASA has reached the World Internet connection record when sent the information embedded in laser beam at a speed of 622 Mbit/s towards NASA satellite orbiting the Moon and returned backwards the same information at a speed of 20 Mbit/s. On October 26, 2013 the ESA’s Optical ground station repeated the same experiment and received the information from the same 400000 km distantly situated NASA satellite at a speed of 40 Mbit/s.

Some colored texts in descriptive part of the Problem are left intentionally in order to show the interconnection with the colored cells of „STEM matrixe‘s row.

- for illustration of the descriptive part of each consecutive Problem the *copyright free pictures, drawings, schemes, diagrams shall be used*. The illustrations shall be added into descriptive part of Problem in this way: in the first problem the illustration shall be added on the right side of page, second – on the left side of the page, third – on the right side of the page and so on. For example, in case of coded problem „M-10.1 – **Problem No. 21“** this shall look like:

- after the descriptive part of each consecutive Problem 1 cm from the left edge of the page *the link shall be presented*, where you can find more appropriate information in English:

For more information visit this webpage.

- after each link in the left edge of page the term of Question ***in bold fonts*** *shall be recorded*:

Question (A):

Here underlined letter „A" between braces means an Answer to Question and shall contain the hyperlink to corresponding answer of Problem.

- after each inscription „**Question (A):**" in the left edge of page ***in bold fonts*** *shall be recorded* text of Question (or set of Questions), eg.:

„ **Let's imagine two imaginary spheres surrounding the Earth. Closest to Earth sphere virtually passes the lowest point of the geostationary ring and farthest from Earth sphere - highest. How much surface of farthest sphere is greater (in percentages) than surface of closest sphere, if the distance to geostationary orbit equals to 35786 km? "**

- after the Question text in the left edge of page *the notes, comments, tips shall be recorded* (if this improves the understanding of the content issue), eg.:

Notice: diameter of Earth equals to 12742 km.

- after the Notice in the left edge of page *the Question compiler's name shall be recorded* (in case compiler is the teacher, the scientist, the former participant of science olympiad and etc.). The text shall be written in non-bold „Georgia" font, font size - „9":

Question compiler: Name, Surname, Position

Once all the above described requirements of Problem's structure formation are obtained we shall get the shape of Problem presented in the Annex - Problem.

e) Space calendar

In the project SPACEOLYMP the Contractor has an obligation to create 350 problems (tasks) distributed within 7 (seven) BoPs (50 problems in each). There was taken decision that it is very

convenient and efficient to exploit the moment when reading BoP's questions the teachers as well the pupils would be granted by the information about historically innovative space events. In the internet there are many websites which describes daily facts from space history. The short description of each day intentionally will be left in english seeking to teach pupils foreighn language.

For that reason there were selected 3 websites:
http://www.spacecalendar.com
http://www.astronautix.com
http://spaceflightnow.com/launch-schedule/

The 350 (even and odd) days of a year were randomly „know-how" distributed among different BoPs and grades, and the lacking 16 days of the year (till 366 days) were covered by 14 world's most prominent dates and two outstanding dates (First human's Space Flight and First Human's Lunar walk) in space history. All 16 days were named as „SPACEOLYMPian days" and there presented in the list of „First ever":

1. Earth's picture from Space – 1946.10.24;
2. Organism in Space – 1946.07.30;
3. Artificial Earth's satellite – 1957.10.04;
4. Animal in Space – 1960.08.19;
5. Human in Space – 1961.04.12;
6. Human in Open space – 1962.03.18;
7. Lunar flyby – 1959.01.04;
8. Object on the Lunar surface – 1959.09.13;
9. Human on the Moon – 1969.07.20;
10. Object on the Mars surface (second closest planet to Earth) – 1971.12.02;
11. Mars rover – 1997.07.05;
12. Landing on Venus (closest planet to Earth) – 1966.03.01;
13. Mercury flyby (planet closest to the Sun) – 1974.03.29;
14. Pluto flyby (outermost Solar dwarf planet) – 2015.07.14;
15. ISS – 1998.12.06;

16*. Landing on asteroid – 2005.11.12 and on comet – 2014.11.12.

*- very unique case, when during the same calendar day spacecrafts first ever landed on asteroid (2005) and comet (2014) surfaces.

The 14 (fourteen) „SPACEOLYMPian days" from total 16 shall randomly be combined to the lists of space events of each BoP, the 15th day will be added to BoP in Mathematics, and the 16th day will be added to BoP in Geography.

The provided information will create the understanding for BoP users that many countries, their space agencies, companies, scientists, engineers and astronauts by cooperating and reaching new targets are the Space history actors and creators.

The non repeating days of a year shall be randomly distributed between BoPs and presented in the tables M, P, C, I, B, A, G. The preselected „SPACEOLYMPian days“ are shortly described hereinbellow and presented after each science subject‘s table. 13 (thirteen) „SPACEOLYMPian days“ will be highlighted in grey color, the April 12th and July 20th – in green color, and November 12th – in blue color. The text of any information shall be written in „Georgia“ font, with a size „12“ and line spacing – „Single“. The links shall be written using font size „10“.

Table M. BoP in Mathematics (53 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January	2	4											1				5			
February	23	25			21				17	19			15				13			
March																				
April	15	17			13				11				7	9			5			
May													29	31			27			
June	8				4	6			2											
July	30				26	28			24				20	22			18			
August																				
September	20				16	18			14				12				8	10	23	30
October																				
November	11				9				5	7			3				1			
December					31				27	29			25				21	23		

„SPACEOLYMPian days“ falling within BoP in Mathematics:

8th grade
January 4 (1959)
http://www.astronautix.com/j/january04.html
https://en.wikipedia.org/wiki/Luna_1
First ever flyby of the Moon.

July 30 (1946)
http://www.astronautix.com/j/july30.html
https://en.wikipedia.org/wiki/Plants_in_space
First ever seeds (maize) launched into space (successfully returned).

11th grade
July 20 (1969)
http://www.astronautix.com/j/july20.html
https://en.wikipedia.org/wiki/Apollo_11
First ever human on the Moon‘s surface.

Table P. BoP in Physics (52 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January																	28	30		
February	9	11			7				3	5			1	22			26			
March					30				26	28			24				22			
April	1	3																		
May	23	25			21					19			15	17			13			
June																				
July	16				12	14				10			6	8			4			
August										31			27	29			25			
September	6				2	4														
October	28				24	26				22			20				16	18		
November																				
December	19				17				13	15			11				7	9		

„SPACEOLYMPian days“ falling within BoP in Physics:

9th grade

July 14 (2015)

http://www.astronautix.com/j/july14.html

https://en.wikipedia.org/wiki/New_Horizons

First ever (closest) flyby of Pluto - farthest from the Sun planet (dwarf).

October 24 (1946)

http://www.astronautix.com/o/october24.html

https://en.wikipedia.org/wiki/V-2_rocket

First ever Earth photo take from space.

Table C. BoP in Chemistry (52 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January	26				24				20	22			18				14	16		
February																				
March	18	20			16				12	14			10				6	8		
April														16			18	29		
May	9	11			7				3	5			1							
June	30				28				26				22	24			20			
July	2																			
August	23				19	21			17				13	15			11			
September																				
October	14				10	12			8				4	6			2			
November									29				27				23	25		
December	5				1	3														

„SPACEOLYMPian days“ falling within BoP in Chemistry:

8th grade

March 18 (1962)

http://www.astronautix.com/m/march18.html

https://en.wikipedia.org/wiki/Alexey_Leonov

First ever human outside the spacecraft in space.

9th grade

August 19 (1960)

http://www.astronautix.com/a/august19.html

https://en.wikipedia.org/wiki/Animals_in_space

First ever animals launched into space (successfully returned).

11th grade
October 4 (1957)
http://www.astronautix.com/o/october04.html
https://en.wikipedia.org/wiki/Sputnik_1
First ever artificial Earth satellite.6

Table I. BoP in Informatics (52 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January	12				8	10			6				3							
February									27	29			24				18	20		
March	4				2															
April	25	27			23				19	21			14				10	12		
May																				
June	16	18			14				10	12			5	7			3	9		
July													27				25			
August	7	9			5				3				1							
September	30				26	28			24				17	22			15			
October																				
November	21				17	19			15				8	13			6			
December																	28	30		

„SPACEOLYMPian days“ falling within BoP in Informatics:

12th grade
April 12 (1961)
http://www.astronautix.com/a/april12.html
https://en.wikipedia.org/wiki/Yuri_Gagarin
First ever human flight in space.

Table B. Biology (52 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January																				
February	16				12	14			10				8				4	6		
March													29	31			27			
April	8				6				2	4										
May	30				28				24	26			22				18	20		
June	1																			
July	21	23			19				15	17			13				11	29	31	
August																				
September	11	13			9				7				3	5			1			
October					31				29				25	27			23			
November	4				2															
December	26				22	24			20				16	18			14			

„SPACEOLYMPian days“ falling within BoP in Biology:

8th grade
September 13 (1959)
http://www.astronautix.com/s/september13.html
https://en.wikipedia.org/wiki/Luna_2
First Lunar approach with a first ever hit of its surface a day after.

11th grade
March 29 (1974)
http://www.astronautix.com/m/march29.html
https://en.wikipedia.org/wiki/Mariner_10
First ever flyby of Mercury – planet closest to the Sun.

Table A. BoP in Astronomy (52 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January					29	31			27				23	25			21			
February	2																			
March	25				21	23			19				17				13	15		
April																				
May	16				14				10	12			8				4	6		
June													29				25	27		
July	7	9			5				1	3										
August	28	30			26				22	24			20				18			
September													19				21			
October	19	21			17				15				11	13			9			
November																	30			
December	12				8	10			6				2	4						

„SPACEOLYMPian days“ falling within BoP in Astronomy:

9th grade
July 5 (1997)
http://www.astronautix.com/j/july05.html
https://en.wikipedia.org/wiki/Mars_3
First ever rover deployed on Mars surface.

10th grade
December 6 (1998)
http://www.astronautix.com/d/december06.html
https://en.wikipedia.org/wiki/International_Space_Station
International Space Station started its activities.

11th grade
December 2 (1971)
http://www.astronautix.com/d/december02.html
https://en.wikipedia.org/wiki/Mars_3
First ever spacecraft landing on Mars surface.

Table G. BoP in Geography (53 days in total)

	8 grade				9 grade				10 grade				11 grade				12 grade			
January	19				15	17			13				9	11				7		
February																		28		
March	11				7	9			5				1	3						
April					28	30			26				24					20	22	
May	2																			
June	23				21				17	19			15					11	13	
July																				
August	14	16			12				8	10			6					2	4	
September									29				27					25		
October	5	7			3				1											
November	26	28			24				22				10	18	20			12	14	16
December																				

„SPACEOLYMPian days“ falling within BoP in Geography:

11th grade
March 1 (1966)
http://www.astronautix.com/m/march01.html
https://en.wikipedia.org/wiki/Venera_3
First ever impact of planet Venus surface.

12th grade
November 12 (2005) & (2014)
http://www.astronautix.com/n/november12.html
https://en.wikipedia.org/wiki/Hayabusa
https://en.wikipedia.org/wiki/Rosetta_(spacecraft)
First ever landing on asteroid‘s (2005) and comet‘s (2014) surfaces*.
*- This day could be claimed as the most unique day in the history when reaching space frontiers.

The information of one page length shall be presented after each 10 (ten) problems (tasks) of different grades in each BoP. It consists of a title „**Space Calendar**“ *written at left side of the page in bold „Georgia“ font of size „12“*:

Space calendar

and two links of source websites *shall be written using „Georgia“ font size „10“ at a right side of the page*:

http://www.spacecalendar.com http://spaceflightnow.com/launch-schedule/

At left side of the page *shall be presented the day with a year* uploaded in a brackets and written in „Georgia“ font of size „12“:

January 2 (2004)

Link to information source of particular day *shall be presented at left side of the page* by using „Georgia“ font size „10“:

http://www.astronautix.com/j/january02.html

Very brief *description of the space event shall be included* and written in Georgia font of size „12“ and line spacing – „Single“:

The „NASA‘s“ spacecraft „Stardust“ took pictures of the „Wild-2“ comet tail and collected particles on „aerogel," a silica foam 99,8% air, the lightest material ever made.

In lithuanian version of BoPs the day event description intentionally will be left in english language in order to teach users (pupils, teachers) for space therminology which in real life usually preveils in English. An example of day „January 2“ from „Space Calendar“ constructed according to described here-in-above procedures shall look like:

Space calendar http://www.spacecalendar.com http://spaceflightnow.com/launch-schedule/

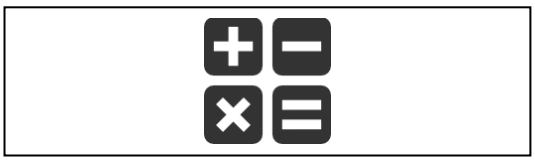
January 2 (2004)
http://www.astronautix.com/j/january02.html
The „NASA's“ spacecraft „Stardust“ took pictures of the „Wild-2“ comet tail and collected particles on „aerogel," a silica foam 99,8% air, the lightest material ever made.

The Contractor reserves the possibility to include as much as possible space-related events of ESA or Lithuanian origin where it is applicable. As well the Contractor leaves the right to initiate a prize for those who will find all the 16 (sixteen) „SPACEOLYMPian days“. In this way the BoP producers (project contractor) will create the circumstances where much more pupils will gain the knowledge about space science and technologies. For example, the very first 10 pupils have found and sent to Contractor all 16 SPACEOLYMPian in sequence should receive commemorative gift – the cardboard copy of one of the first of two Lithuanian cubesat's „LituanicaSAT-1“ with its creators Vytenis Buzas and Laurynas Mačiulis autographs. The shape of cardboard cubesat „LituanicaSAT-1“ is enclosed in the Annex – LituanicaSAT-1.

f) Structure of Answer

To separate Answers of different grades from each other the earmark of specific grade consisting of the picture of science subject (see II, b) and the text „Grade“ with appropriate number in the right shall be created.

In the center of page *the symbol of corresponding science subject shall be inserted* , eg. in case of BoP in Mathematics:



After the symbol of science subject *in the center of the row* ***the bolded grade with its number*** *shall be written* in „Georgia“ font of size „18“:

Grade 10

This way in all BoPs before each set of Answers of different grades the graphical-textual earmark shall be presented. For example, in case of Answers of 10th grade of BoP in Mathematics the earmark shall look like:

Grade 10

- after earmark in the left edge of page according to the order the *code of **bolded serial number** of Answer shall be recorded*, eg.:

M-10.1 (Q)

here „M-10.1" is problem's code, where „M" refers to the science subject „Mathematics", „10" refers to the tenth grade, „1" means the serial number of problem in the tenth grade. The underlined letter „Q" between braces means the Question and shall contain embedded hyperlink leading backwards to the corresponding Problem – „ M-10.1 – **Problem No. 21 "**;

- in the right edge of the same row the term „Return to Content" with embedded link of bookmark shall be recorded:

Return to Content

which consist the embedded hyperlink leading backwards to bookmark of BoP's Content.

Further follows the commentary of solution (if necessary) with initial data, constants and etc.:

Text of comment on Problem solution.

Finally, the Answer is presented, where „**Answer:**" *shall be written in **bold „Georgia" font***, and the text of answer in regular „Georgia" font, both of sizes „12":

Answer: 0,714416 %.

After performing of all above described requirements we'll get the following appearance of the Answer into question of „M-10.1 – **Problem No. 21”**:

M-10.1 (Q) Return to Content
(*If necessary, comment of problem solution shall be written in regular „Georgia“ font of size „12“*).
Answer: 0,714416 %.

After first Answer follows the Answer to second question „M-10.2 – **Problem No. 22”** and so on.

g) Information sources

After all the Problems of BoP are listed the literature corresponding to particular science subject shal be provided:

INFORMATION SOURCE

The text „**INFORMATION SOURCE**“ *shall be written in the middle of the page line in capital* ***bold „Georgia“ font***.

The links of World leading Space agencies after all the Problems shall be included in each BoP:

ESA - http://www.esa.int/ESA/Our_Missions
NASA - https://www.nasa.gov/missions
DLR - http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10012/#/Missionen/Start/Feature
JAXA - http://global.jaxa.jp/projects/
CNSA - http://www.cnsa.gov.cn/n6443408/index.html
CNES - https://cnes.fr/en/fiches_mission_alpha
ISRO - http://www.isro.gov.in/missions-0
Roscosmos - http://en.roscosmos.ru/

As well usefull links of science subjects shall be included into each BoP respectivelly:

Mathematics
http://spacemath.gsfc.nasa.gov/
http://www.nasa.gov/hrp/communications/estm-project

Physics
http://funphysics.jpl.nasa.gov/

Chemistry
http://science.gsfc.nasa.gov/solarsystem/astrochemistry/ -
http://www.astrobio.net/topic/deep-space/cosmic-evolution/the-chemistry-of-space/
http://pubs.acs.org/doi/abs/10.1021/ed064p228

Informatics
http://hpde.gsfc.nasa.gov/Borne_Informatics.ppt
http://serc.carleton.edu/usingdata/index.html
http://d320goqmya1dw8.cloudfront.net/files/usingdata/UsingData.pdf
http://www.dlese.org/library/index.jsp

Biology
http://www.nasa.gov/directorates/heo/slpsra/20130529_spacebio_nraawards.html#.VieS2NLhDEY
http://www.nasa.gov/hrp/education
http://www.nasa.gov/hrp/bodyinspace
https://www.nasa.gov/ames/research/space-synthetic-biology-home

Astronomy
https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Space.Based.Astronomy.html#.VieUP9LhDEY
https://www.nasa.gov/pdf/58277main_Space.Based.Astronomy.pdf
http://www.nasa.gov/audience/forstudents/5-8/index.html

Geography
http://www.nasa.gov/audience/foreducators/k-4/features/F_Mission_Geography_K-4.html
http://www.esa.int/Our_Activities/Space_Science/Mars_Express/Geography_of_Mars
http://www.moon.com.co/atlas/

as well the references of general manner shall be included:

General references
http://www.nasa.gov/audience/foreducators/stem-on-station/lessons
http://www.nasa.gov/audience/foreducators/k-4/features/materials_archive_1.html
http://mynasadata.larc.nasa.gov/educators/

Information on Launch vehicles, Satellites, Space Shuttle and Astronautics:
http://space.skyrocket.de/index.html

h) Vocabulary

The short explanation of each colored STEM matrix's cell (see IV., c) shall be presented in the following way:

Telescope
Earth or Space based instrument for observation of remote objects.

Astronaut
Person trained for human spaceflight (as well cosmonaut or taikonaut).

Robot
Mechanical aparatus capable to perform programmed physical tasks in space.

Rocket
Flying space device powered by the reactive force.

Shuttle
Reusable spaceplane for Earth orbiting or human/cargo delivery to ISS.

ISS
Earth's largest artificial satellite - International Space Station.

Cubesat
Earth's artificial cube shaped satellite, dimensions 10×10×10 cm, mass – 1 kg.

Satellite
Artificial object launched by human efforts and orbiting any space body.

Rover
Vehicle designed to explore surface of any space body.

Probe
Automatic spacecraft exploring bodies of Solar system.

Earth
Third planet from the Sun and fifth largest planet of Solar system.

Moon
Earth's natural satellite.

Mars
Fourth planet from the Sun and seventh largest planet of Solar system.

Planet
Space body revolving around a star (including the Sun).

Sun
Earth's closest star.

Comet
Small icy space body (cometoid), when passing close to the Sun displaying coma or tail.

Asteroide
Minor planet (planetoid) orbiting the Sun in elliptical orbit.

Meteorite
Debris from space object (meteoroid) survived the passage through atmosphere.

Temperature
Object‘s (space body) warmth.

Mass
Quantity of matter.

Gravity
Interaction between material bodies depending on their mass.

Atmosphere
Gas layer surrounding space body of sufficient mass.

Frequency
Event recurrence per unit of time.

Radiation
Spontaneous decay of atomic nuclei.

Wave
Energy transfer in space and time.

Magnetism
Magnetic interaction occuring between the moving electric charges.

NASA
National Aeronautics and Space Administration – governmental agency of USA.

ESA
European Space Agency – intergovernmental space exploration organisation.

Roscosmos
Roscosmos State Corporation for Space Activities – governmental body of Russia.

JAXA
Japan‘s National Aero-space Agency - national agency of Japan.

CNSA
China National Space Administration - national agency of China.

ISRO
Indian Space research Organisation – governmental agency of India.

CNES
National Center of Space Research - governmental agency of France.

DLR
German Aerospace Center – national center of Germany.

Time

Duration of object (space body) existence.

Period

Time elapsed for one rotation of object (space body) around its axis or other space body.

Angle

Figure (area) formed by two rays sharing the common endpoint.

Coordinate

Object‘s (space body) position in plane or space.

Trajectory

Path that moving object (space body) follows through space.

Orbit

Curved path of moving object (space body) around other object (space body).

Distance

Lenght (interstice) between objects (space body) in plane or space.

Velocity

Completed distance of object (space body) per unit of time.

Mathematics

Science of structures, variations and spatial patterns.

Physics

Science of all forms of matter.

Chemistry

Science of chemical elements and nature of materials.

Informatics

Science of information processing and storage, the use of computers.

Biology

Science of life and living organisms.

Astronomy

Science of celestial objects and processes outside the atmosphere of Earth.

Geography

Science of the lands, the features, the inhabitants and the phenomena of Earth.

i) Special marking

At the end of each BoP the following marking shall be used:

j) Catalogue of space events (missions or similar**) at World leading space agencies**

In order to make simplier and easier work of Contractor (or other creators) by creating BoPs something like SPACEOLYMP-oriented data base or Catalogue shall be created.

The following structure of Excel sheet with approximatelly 1000 items of records shall be prepared and completed:

Subject	Agency	Mission	Wiki	Original website	Rockets/Launchers	Start date	Orbit

LITHUANIAN INNOVATION CENTRE SPACEOLYMP esa

Subject	Agency	Mission	Wiki	Original website	Rockets/Launchers	Start date	Orbit
		http://www.esa.int/Our_Activities/Telecommunications_Integrated_Applications/Historical_overview					
		http://www.esa.int/ESA/Our_Missions					
Telescope/Spacecraft	ESA	Astrophysics/High Energy/X-ray	https:/	Athena	Ariane 6	2028	L2
Satellite/Spaceobservator	ESA	Planet/Exoplanet/Star	https:/	Plato	Soyuz-ST	2024	L2
Planet	ESA	Jupiter Moon observer	https:/	JUICE	Ariane 5 ECA	2030	Jupiter
Satellite	ESA	Earth observation/Chlorophyl/Vegetation	https:/	FLEX		2022	LEO
Satellite	ESA	Earth observation/Meteorology	https:/	MetOp	Soyuz ST Fregat	2006.10.18;2012.09.17;2018	SSO
Satellite/Electric	ESA	Telecommunication/Electric propulsion	https:/	ELECTRA		2021	GEO
Satellite/Space telescope	ESA	Astronomy/Mapping Universe/K band	https:/	Euclid	Soyuz-2.1b	2020 Q4	L2
Satellite	ESA	Earth observation/Meteorology	https:/	Biomass		2020	
Satellite	ESA	Earth observation/Meteorology	http://	MTG (Meteosat)		2021	
Satellite	ESA	Telecommunication	https:/	Neosat		2019	
Satellite	ESA	Earth observation/Meteorology	https:/	EarthCARE	Soyuz ST-B	2018	SSO
Satellite	ESA	Space Science	https:/	BepiColombo	Ariane 5	2018 October	Mercury
Satellite/Space telescope	ESA	Space Science/Telescope ~Hubble	https:/	James Webb JWST	Ariane 5	2018 October	L2
Satellite/Orbiter	ESA	Sun exploration/Heliosphere	https:/	Solar Orbiter	Atlas V	2018 October	Eliptic O
Satellite/Telescope	ESA	Exoplanet transit	https:/	CHEOPS	Soyuz or Vega	2018	SSO
Satellite	ESA	Telecommunication	http://	Quantum	Falcon-9 v1.2	>2018	GEO
Satellite	ESA	Automatic_Identification_System	https:/	SAT-AIS		2018	
Satellite	ESA	Weather	https:/	ADM-Aeolus	Vega	2017	SSO
Satellite	ESA	Telecommunication	http://	Smallgeo (Artes 11)		2017	GEO
Robotic	ESA	ISS/Robotic arm	https:/	European Robotic Arm	Proton rocket	2017	ISS
Satellite	ESA	Telecommunication/Data relay	https:/	EDRS	Proton-M	2016.01/2017	GEO
Satellite	ESA	Space Science	https:/	Exomars		2016.03.14; 2020	Mars
Satellite	ESA	Space Science/Gravitational	https:/	LISA pathfinder	Vega	2015.12.03	L1
Modules	ESA	Reentry technology	https:/	IXV	Vega	2015.02.11	
Satellite/Largest	ESA	Telecommunication	https:/	Alphasat	Ariane 5	2013.07.25	GEO
Satellite/Observatory	ESA	3D space catalog/Astronomy	https:/	Gaia	Soyuz ST-B	2013.12.19	L2
Satellite	ESA	Earth/Magnetic field	https:/	Swarm	Rokot/Briz-KM	2013.11.12	LEO
Programme	ESA	Earth observation	https:/	Copernicus/Sentinel		2014.04.03	
Rocket	ESA	Launchers	https:/	VEGA		2012.02.13	

Of course, the Catalogue will serve as convenient data source for users willing to create problems (tasks) on their own. Finally the flipping book together with QR code shall be created.

k) Specialized literature

In order to make easier Contractor‘s activities by creating BoPs the specialized school literature of different grades becomes of great importance. The hereinbellow literature was purchased by Contractor as an integral part of BoP‘s preparation:

No.	List of Specialized literature	Source	Cover
1.	Matematika Tau Plius 8 kl. Uždavinynas (*Mathematics for You Plus, Grade 8, Book of Problems*)	Link	Image
2.	Matematika Tau Plius 9 kl. Uždavinynas (*Mathematics for You Plus, Grade 9, Book of Problems*)	Link	Image
3.	Matematika Tau Plius 10 kl. Uždavinynas (*Mathematics for You Plus, Grade 10, Book of Problems*)	Link	Image
4.	Matematika Tau Plius 11 kl. Išplėstinis kursas. Uždavinynas (*Mathematics for You Plus, Grade 11, Advanced course, Book of Problems*)	Link	Image
5.	Matematika Tau Plius 12 kl. Išplėstinis kursas. Uždavinynas (*Mathematics for You Plus, Grade 12, Advanced course, Book of Problems*)	Link	Image
6.	Matematika 2001-2010, Į pagalbą abiturientui (*Mathematics 2001-2010, In the aid of graduate*)	Link	Image
7.	Fizika 2011-2015, Į pagalbą abiturientui (*Physics 2001-2010, In the aid of graduate*)	Link	Image
8.	Chemija 2000-2011, Į pagalbą abiturientui (*Chemistry 2000-2011, In the aid of graduate*)	CD	
9.	Biologija 2009-2012, Į pagalbą abiturientui (*Biology 2009-2012, In the aid of graduate*)	Link	Image
10.	Informacinės technologijos 2005-2009, Į pagalbą abiturientui (*Information technology 2005-2009, In the aid of graduate*)	Link	Image
11.	Geografija 2007-2011, Į pagalbą abiturientui (*Geography 2007-2011, In the aid of graduate*)	CD	

l) BoP template forms

When creating very first BoP of project SPACEOLYMP (in Mathematics) there were received proposal (request) from the teachers to create the possibility of downloadable problems for separate grades. Contractor accepted this request. Even more, in order for representatives of other science subjects not to wait for the final results of project SPACEOLYMP the Contractor decided to create the templates of Book of Problems of various formats. The coded file structure consisting of the science subject name, words „ESA“, „Space“ and „Innovation“, term „FORM“ and the grade number shall be created.

For users from Lithuania:

EKA $_{\text{Science subject}}$, Kosmosas, Inovacijos FORMA.docx;
EKA $_{\text{Science subject}}$, Kosmosas, Inovacijos FORMA8.docx
EKA $_{\text{Science subject}}$, Kosmosas, Inovacijos FORMA9.docx
EKA $_{\text{Science subject}}$, Kosmosas, Inovacijos FORMA10.docx
EKA $_{\text{Science subject}}$, Kosmosas, Inovacijos FORMA11.docx
EKA $_{\text{Science subject}}$, Kosmosas, Inovacijos FORMA12.docx

42 template files (downloadable BoP templates in lithuanian) shall be created in total, where $_{\text{Science subject}}$ = Matematika, Fizika, Chemija, Informatika, Biologija, Astronomija, Geografija. As well the „docx“ files conversion into „pdf“ format shall be executed.

The list of all docx templates is following:

- EKA Matematika, Kosmosas, Inovacijos FORMA.docx
- EKA Matematika, Kosmosas, Inovacijos FORMA8.docx
- EKA Matematika, Kosmosas, Inovacijos FORMA9.docx
- EKA Matematika, Kosmosas, Inovacijos FORMA10.docx
- EKA Matematika, Kosmosas, Inovacijos FORMA11.docx
- EKA Matematika, Kosmosas, Inovacijos FORMA12.docx
- EKA Fizika, Kosmosas, Inovacijos FORMA.docx
- EKA Fizika, Kosmosas, Inovacijos FORMA8.docx
- EKA Fizika, Kosmosas, Inovacijos FORMA9.docx
- EKA Fizika, Kosmosas, Inovacijos FORMA10.docx
- EKA Fizika, Kosmosas, Inovacijos FORMA11.docx
- EKA Fizika, Kosmosas, Inovacijos FORMA12.docx
- EKA Chemija, Kosmosas, Inovacijos FORMA.docx
- EKA Chemija, Kosmosas, Inovacijos FORMA8.docx
- EKA Chemija, Kosmosas, Inovacijos FORMA9.docx
- EKA Chemija, Kosmosas, Inovacijos FORMA10.docx
- EKA Chemija, Kosmosas, Inovacijos FORMA11.docx
- EKA Chemija, Kosmosas, Inovacijos FORMA12.docx
- EKA Informatika, Kosmosas, Inovacijos FORMA.docx
- EKA Informatika, Kosmosas, Inovacijos FORMA8.docx
- EKA Informatika, Kosmosas, Inovacijos FORMA9.docx
- EKA Informatika, Kosmosas, Inovacijos FORMA10.docx
- EKA Informatika, Kosmosas, Inovacijos FORMA11.docx
- EKA Informatika, Kosmosas, Inovacijos FORMA12.docx
- EKA Biologija, Kosmosas, Inovacijos FORMA.docx
- EKA Biologija, Kosmosas, Inovacijos FORMA8.docx
- EKA Biologija, Kosmosas, Inovacijos FORMA9.docx
- EKA Biologija, Kosmosas, Inovacijos FORMA10.docx
- EKA Biologija, Kosmosas, Inovacijos FORMA11.docx
- EKA Biologija, Kosmosas, Inovacijos FORMA12.docx
- EKA Astronomija, Kosmosas, Inovacijos FORMA.docx

- EKA Astronomija, Kosmosas, Inovacijos FORMA8.docx
- EKA Astronomija, Kosmosas, Inovacijos FORMA9.docx
- EKA Astronomija, Kosmosas, Inovacijos FORMA10.docx
- EKA Astronomija, Kosmosas, Inovacijos FORMA11.docx
- EKA Astronomija, Kosmosas, Inovacijos FORMA12.docx
- EKA Geografija, Kosmosas, Inovacijos FORMA.docx
- EKA Geografija, Kosmosas, Inovacijos FORMA8.docx
- EKA Geografija, Kosmosas, Inovacijos FORMA9.docx
- EKA Geografija, Kosmosas, Inovacijos FORMA10.docx
- EKA Geografija, Kosmosas, Inovacijos FORMA11.docx
- EKA Geografija, Kosmosas, Inovacijos FORMA12.docx

The list of all pdf templates is following:

- EKA Matematika, Kosmosas, Inovacijos FORMA.pdf
- EKA Matematika, Kosmosas, Inovacijos FORMA8.pdf
- EKA Matematika, Kosmosas, Inovacijos FORMA9.pdf
- EKA Matematika, Kosmosas, Inovacijos FORMA10.pdf
- EKA Matematika, Kosmosas, Inovacijos FORMA11.pdf
- EKA Matematika, Kosmosas, Inovacijos FORMA12.pdf
- EKA Fizika, Kosmosas, Inovacijos FORMA.pdf
- EKA Fizika, Kosmosas, Inovacijos FORMA8.pdf
- EKA Fizika, Kosmosas, Inovacijos FORMA9.pdf
- EKA Fizika, Kosmosas, Inovacijos FORMA10.pdf
- EKA Fizika, Kosmosas, Inovacijos FORMA11.pdf
- EKA Fizika, Kosmosas, Inovacijos FORMA12.pdf
- EKA Chemija, Kosmosas, Inovacijos FORMA.pdf
- EKA Chemija, Kosmosas, Inovacijos FORMA8.pdf
- EKA Chemija, Kosmosas, Inovacijos FORMA9.pdf
- EKA Chemija, Kosmosas, Inovacijos FORMA10.pdf
- EKA Chemija, Kosmosas, Inovacijos FORMA11.pdf
- EKA Chemija, Kosmosas, Inovacijos FORMA12.pdf
- EKA Informatika, Kosmosas, Inovacijos FORMA.pdf
- EKA Informatika, Kosmosas, Inovacijos FORMA8.pdf
- EKA Informatika, Kosmosas, Inovacijos FORMA9.pdf
- EKA Informatika, Kosmosas, Inovacijos FORMA10.pdf
- EKA Informatika, Kosmosas, Inovacijos FORMA11.pdf
- EKA Informatika, Kosmosas, Inovacijos FORMA12.pdf
- EKA Biologija, Kosmosas, Inovacijos FORMA.pdf
- EKA Biologija, Kosmosas, Inovacijos FORMA8.pdf
- EKA Biologija, Kosmosas, Inovacijos FORMA9.pdf
- EKA Biologija, Kosmosas, Inovacijos FORMA10.pdf
- EKA Biologija, Kosmosas, Inovacijos FORMA11.pdf
- EKA Biologija, Kosmosas, Inovacijos FORMA12.pdf
- EKA Astronomija, Kosmosas, Inovacijos FORMA.pdf
- EKA Astronomija, Kosmosas, Inovacijos FORMA8.pdf
- EKA Astronomija, Kosmosas, Inovacijos FORMA9.pdf
- EKA Astronomija, Kosmosas, Inovacijos FORMA10.pdf
- EKA Astronomija, Kosmosas, Inovacijos FORMA11.pdf
- EKA Astronomija, Kosmosas, Inovacijos FORMA12.pdf
- EKA Geografija, Kosmosas, Inovacijos FORMA.pdf
- EKA Geografija, Kosmosas, Inovacijos FORMA8.pdf
- EKA Geografija, Kosmosas, Inovacijos FORMA9.pdf
- EKA Geografija, Kosmosas, Inovacijos FORMA10.pdf
- EKA Geografija, Kosmosas, Inovacijos FORMA11.pdf
- EKA Geografija, Kosmosas, Inovacijos FORMA12.pdf

For other users (english version):

ESA $_{\text{Science subject}}$, Space, Innovation FORM.docx
ESA $_{\text{Science subject}}$, Space, Innovation FORM8.docx
ESA $_{\text{Science subject}}$, Space, Innovation FORM9.docx

ESA $_{\text{Science subject}}$, Space, Innovation FORM10.docx
ESA $_{\text{Science subject}}$, Space, Innovation FORM11.docx
ESA $_{\text{Science subject}}$, Space, Innovation FORM12.docx

42 template files (downloadable BoP templates in english) shall be created in total, where

$_{\text{Science subject}}$ = Mathematics, Physics, Chemistry, Informatics, Biology, Astronomy, Geography. As well the „docx“ files conversion into „pdf“ format shall be executed.

The list of all docx templates is following:

- ESA Mathematics, Space, Innovation FORM.docx
- ESA Mathematics, Space, Innovation FORM8.docx
- ESA Mathematics, Space, Innovation FORM9.docx
- ESA Mathematics, Space, Innovation FORM10.docx
- ESA Mathematics, Space, Innovation FORM11.docx
- ESA Mathematics, Space, Innovation FORM12.docx
- ESA Physics, Space, Innovation FORM.docx
- ESA Physics, Space, Innovation FORM8.docx
- ESA Physics, Space, Innovation FORM9.docx
- ESA Physics, Space, Innovation FORM10.docx
- ESA Physics, Space, Innovation FORM11.docx
- ESA Physics, Space, Innovation FORM12.docx
- ESA Chemistry, Space, Innovation FORM.docx
- ESA Chemistry, Space, Innovation FORM8.docx
- ESA Chemistry, Space, Innovation FORM9.docx
- ESA Chemistry, Space, Innovation FORM10.docx
- ESA Chemistry, Space, Innovation FORM11.docx
- ESA Chemistry, Space, Innovation FORM12.docx
- ESA Informatics, Space, Innovation FORM.docx
- ESA Informatics, Space, Innovation FORM8.docx
- ESA Informatics, Space, Innovation FORM9.docx
- ESA Informatics, Space, Innovation FORM10.docx
- ESA Informatics, Space, Innovation FORM11.docx
- ESA Informatics, Space, Innovation FORM12.docx
- ESA Biology, Space, Innovation FORM.docx
- ESA Biology, Space, Innovation FORM8.docx
- ESA Biology, Space, Innovation FORM9.docx
- ESA Biology, Space, Innovation FORM10.docx
- ESA Biology, Space, Innovation FORM11.docx
- ESA Biology, Space, Innovation FORM12.docx
- ESA Astronomy, Space, Innovation FORM.docx
- ESA Astronomy, Space, Innovation FORM8.docx
- ESA Astronomy, Space, Innovation FORM9.docx
- ESA Astronomy, Space, Innovation FORM10.docx
- ESA Astronomy, Space, Innovation FORM11.docx
- ESA Astronomy, Space, Innovation FORM12.docx
- ESA Geography, Space, Innovation FORM.docx
- ESA Geography, Space, Innovation FORM8.docx
- ESA Geography, Space, Innovation FORM9.docx
- ESA Geography, Space, Innovation FORM10.docx
- ESA Geography, Space, Innovation FORM11.docx
- ESA Geography, Space, Innovation FORM12.docx

The list of all pdf templates is following:

- ESA Mathematics, Space, Innovation FORM.pdf
- ESA Mathematics, Space, Innovation FORM8.pdf
- ESA Mathematics, Space, Innovation FORM9.pdf
- ESA Mathematics, Space, Innovation FORM10.pdf
- ESA Mathematics, Space, Innovation FORM11.pdf
- ESA Mathematics, Space, Innovation FORM12.pdf
- ESA Physics, Space, Innovation FORM.pdf
- ESA Physics, Space, Innovation FORM8.pdf

- ESA Physics, Space, Innovation FORM9.pdf
- ESA Physics, Space, Innovation FORM10.pdf
- ESA Physics, Space, Innovation FORM11.pdf
- ESA Physics, Space, Innovation FORM12.pdf
- ESA Chemistry, Space, Innovation FORM.pdf
- ESA Chemistry, Space, Innovation FORM8.pdf
- ESA Chemistry, Space, Innovation FORM9.pdf
- ESA Chemistry, Space, Innovation FORM10.pdf
- ESA Chemistry, Space, Innovation FORM11.pdf
- ESA Chemistry, Space, Innovation FORM12.pdf
- ESA Informatics, Space, Innovation FORM.pdf
- ESA Informatics, Space, Innovation FORM8.pdf
- ESA Informatics, Space, Innovation FORM9.pdf
- ESA Informatics, Space, Innovation FORM10.pdf
- ESA Informatics, Space, Innovation FORM11.pdf
- ESA Informatics, Space, Innovation FORM12.pdf
- ESA Biology, Space, Innovation FORM.pdf
- ESA Biology, Space, Innovation FORM8.pdf
- ESA Biology, Space, Innovation FORM9.pdf
- ESA Biology, Space, Innovation FORM10.pdf
- ESA Biology, Space, Innovation FORM11.pdf
- ESA Biology, Space, Innovation FORM12.pdf
- ESA Astronomy, Space, Innovation FORM.pdf
- ESA Astronomy, Space, Innovation FORM8.pdf
- ESA Astronomy, Space, Innovation FORM9.pdf
- ESA Astronomy, Space, Innovation FORM10.pdf
- ESA Astronomy, Space, Innovation FORM11.pdf
- ESA Astronomy, Space, Innovation FORM12.pdf
- ESA Geography, Space, Innovation FORM.pdf
- ESA Geography, Space, Innovation FORM8.pdf
- ESA Geography, Space, Innovation FORM9.pdf
- ESA Geography, Space, Innovation FORM10.pdf
- ESA Geography, Space, Innovation FORM11.pdf
- ESA Geography, Space, Innovation FORM12.pdf

After the preparation of all hereinabove BoP „pdf“ templates the conversion from „pdf“ to flipping book format via free of charge www.fliphtml5.com shall be realized. All created BoP template forms shall be presented in website www.inovacijos.lt.

Since the downloadable templates will be presented in Contractor‘s website, everybody (teachers, pupils, classes, schools) seeking to create their own BoP could use prearranged template forms for STEM dissemination purposes.

The most attractive way of activities for nowadays pupils is the usage of Smart phones. The Contractor evaluated this phenomenon and took decision to create QR codes (*Quick Reponse Code*). The only requirement for smart phone users is that ones shall contain application „ScanLite“. When using QR code the user shall switch this application on and after it use the framed area directing it towards cells of table consisting of various QR codes. Shortly on the mobile‘s screen the “flipping“ book shall appear. For example, intersection cell of raw „Informatics“ and column „Grade 9“ (see page 48) will download Book of Problem for Informatics dedicated to Grade 9 pupils, consisting of 10 Space-related tasks.

The QR code table of templates of Book of Problems shall be created in the following way:

Books of Problems (templates)						
Science	Full version	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
Mathematics						
Physics						
Chemistry						
Informatics						
Biology						
Astronomy						
Geography						

Instruction manual of Book of Problems from SPACEOLYMP

Smart phone shall contain application „ScanLite“. After the application is switched on the user shall direct the framed area towards cells of table consisting of various QR codes (*Quick Reponse Code*). For example, intersection cell of raw „Informatics“ and column „Grade 9“ will download Book of Problem for Informatics dedicated to Grade 9 pupils, consisting of 10 Space-related tasks. The result will be “flipping“ book on smart phones screen.

Actually the overall result (BoPs of 7 sciences subjects) of the project SPACEOLYMP could be presented in the capacity of one page (see tablo above).

V. Promotion of SPACEOLYMP

The organizers of National Space Olympiads (NSO) shall be determined, the contatcs shall be established, the dates of possible Contractor‘s participation at NSO shall be evaluated and Space-promotional lectures for teachers at National Science Olympiads of year 2016 shall be organized.

a) Contractor‘s participation at NSO-2016

The Lithuanian Centre of non-formal youth education as the main body organizing National Science Olympiads was determined. The places where National Science Olympiads will be held were submitted:

Topic	Date	City, School	Coordinator
Biology	March 10, 2016	Anykščiai, Jonas Biliūnas gymnasium	Rūta Leinartaitė
Chemistry	March 17, 2016	Vilnius, King Mindaugas School	Rūta Leinartaitė
Mathematics	March 23, 2016	Šiauliai, Stasys Šalkauskis gymnasium	Liliana Rukienė
Physics	April 7, 2016	Birštonas, Birštonas gymnasium	Rūta Leinartaitė
Informatics	April 11, 2016	Prienai, Žiburio gymnasium	Liliana Rukienė
Astronomy	April 28, 2016	Vilnius, Lithuanian Centre of non-formal youth education	Aurelija Visockienė
Geography	2017	TBD	

b) Confirmation of lectures schedule

The schedulles of National Science Olympiads with Lithuanian Centre of non-formal youth education were approved, and Contractor‘s presentation time, duration and title were accepted and included into agendas.

Source of information:

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/olimpiadu%20grafikas_2015-2016%20m.pdf

List of agendas with included Contractor‘s presentations at National Science Olympiads:

Biology

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/litbo%2049%20programa%20mokytojams.pdf

Chemistry

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/Mokytoj%C5%B3_programa_che54.pdf

Mathematics

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/LMMO%202016%20dienotvarke_Siauliai%20(2).pdf

Physics

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/MOKYTOJ%C5%B264-osios%20Lietuvos%20mokini%C5%B3%20fizikos%20olimpiados%20programa.pdf

Informatics

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/GALUTINE%20dienotvarke_LMIO%202016.pdf

Astronomy

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/astronomai-dienotvarke-2016-2.pdf

6 (six) business trips in total shall be organized within the year 2016.

Additional information for year 2017:

http://www.lmnsc.lt/supadmin/kiti/lmitkcedit/uploads/files2/2017_renginiu%20grafikas(olimpiados).pdf

c) Presentation of project SPACEOLYMP

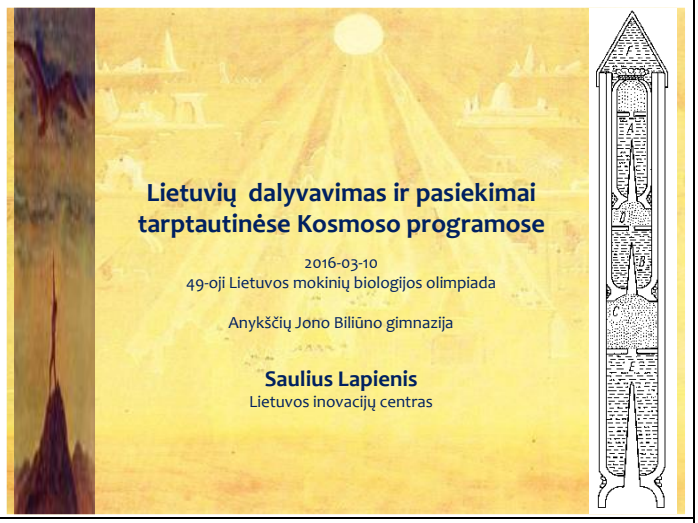
The presentation (promotion) slideshow of project SPACEOLYMP shall be prepared containing as from 15 slides. The first slideshow (something like project participant‘s memory) was held at 49th National Biology Olympiad on March 10, 2016, in Anykščiai Jonas Biliūnas gymnasium (Liudiškių str.. 49, Anykščiai).

49th	54th	65th	64th	27th	14th
National					
Biology	Chemistry*	Mathematics*	Physics*	Informatics*	Astronomy*
science olympiads were held in					
March 10, 2016, Anykščiai Jonas Biliūnas gymnasium	March 17, 2016, Vilnius King Mindaugas school	March 23, 2016, Šiauliai Stasys Šalkauskis gymnasium	April 7, 2016, Birštonas gymnasium	April 11, 2016, Prienai „Ąžuolas“ progymnasium	April 28, 2016, Lithuanian Centre of non-formal youth education
Audience: teachers accompanying olympiad participants					

* - the content of all presentations is the same like in the presentation for teachers of Biology, excepting pages 7, 9, 12 and 14 (see Annex – SPACEOLYMP). The slides 7, 9, 12 and 14 for other science subjects are presented at the end of Annex SPACEOLYMP.

d) Space-promotional lectures at NSO-2016

Space-promotional lectures "Participation and achievements of Lithuanians in the International space programs" for teachers at National Science Olympiads in Biology, Chemistry, Mathematics, Physics, Informatics and Astronomy. The table with coverpages of presentations presented hereinbellow:

Lectures at:	Cover page
49th National Biology science olympiad. Audience: teachers accompanying olympiad participants Olympiad was held in March 10, 2016, Anykščiai Jonas Biliūnas gymnasium (Liudiškių str. 49, Anykščiai).	
54th National Chemistry science olympiad. Audience: teachers accompanying olympiad participants Olympiad was held in March 17, 2016, Vilnius King Mindaugas school (Mindaugo str. 9/1, Vilnius)	
65th National Mathematics science olympiad. Audience: teachers accompanying olympiad participants Olympiad was held in March 23, 2016, Šiauliai Stasys Šalkauskis gymnasium (S. Šalkauskio str. 3, Šiauliai)	

64th National Physics science olympiad. Audience: teachers accompanying olympiad participants Olympiad was held in April 7, 2016, Birštonas gymnasium (Kęstučio str. 29, Birštonas)	
27th National Informatics science olympiad. Audience: teachers accompanying olympiad participants Olympiad was held in April 11, 2016, Prienai „Ąžuolas“ progymnasium (Kęstučio str. 45, Prienai)	
14th National Astronomy science olympiad. Audience: teachers accompanying olympiad participants Olympiad was held in April 28, 2016, Lithuanian Centre of non-formal youth education (Žirmūnų str. 1B, Vilnius)	

The full slide presentation can be found in Annex L-1, Annex L-2, Annex L-3, Annex L-4 and Annex L-5. The whole presentation is splitted into five parts, which corresponds to different Lithuania's history periods. The most attractive form of presentation shall be of flipping book format created with support of fliphtml5.com. The historical and technological facts could be used by creating BoPs of various science subjects.

VI. Structure of Technical Notes

The hereinbellow presented procedure shall be applied for Technical Notes of working packages WP-SPOL 3; WP-SPOL 4; WP-SPOL 5; WP-SPOL 6; WP-SPOL 7; WP-SPOL 8; WP-SPOL 9.

1) Brief description what was done by creating Book of Problems of relevant science subject;

2) Brief abstract of the information which was used by creating Book of Problems of relevant science subject;

3) Contractor‘s working time allocation table with brief comments of relevant science subject;

4) Package of Questionnaires (copies of completed Questionnaires shall be enclosed); the list of e-mail recipients for completion of Questionnaires of relevant science subjects shall be enclosed;

3) Package of Consents (copies of completed Consents shall be enclosed); the list of e-mail recipients invited for participation in project SPACEOLYMP in relevant science subject shall be enclosed;

4) Invitation to workshop of relevant science subject (enclosed); the list of e-mail recipients invited for participation at workshop shall be enclosed;

5) Brief description of workshop participants of relevant science subject (list of participants with signatures shall be enclosed);

6) Workshop material of relevant science subject (ppt shall be enclosed);

7) Comparative statistical analysis (optional) of coverage of pupils in the regions of Lithuania by teachers participating in the project SPACEOLYMP according to data taken from the Lithuanian Department of Statistics. Notice: the analysis could be presented in the Final report of the project SPACEOLYMP.

a) Book of Problems

Describing Technical Note of Book of Problems the following activities shall be briefly presented:

1) writing of the foreword of Book of Problems;

2) selection of STEM table for Grade 8 from Annex M, or Annex P, or Annex C, or Annex I, or Annex B, or Annex A or Annex G accordingly;

3) creation of 10 (ten) descriptive parts of 10 Problems from the Catalogue (page 42) arba Annexes L-1, L-2, L-3, L-4, L-5 (page 105);

4) selection of 10 (ten) open source pictures from the Catalogue (page 42) or Annexes L-1, L-2, L-3, L-4, L-5 (page 105);

5) selection and adaptation of 10 (ten) open source questions from previously organized regional or national science olympiads;

6) selection of 10 (ten) links for more information from the Catalogue (page 42 or Annexes L-1, L-2, L-3, L-4, L-5 (page 105);

7) making of Space Calendar from the Table M, or Table P, or Table C, or Table I, or Table B, or Table A or Table G accordingly (pages 27-33);

8) The procedure of same set of activities 2) - 7) shall be performed for Grade 9 accordingly to science subject;

9) The procedure of same set of activities 2) - 7) shall be performed for Grade 10 accordingly to science subject;

10) The procedure of same set of activities 2) - 7) shall be performed for Grade 11 accordingly to science subject;

11) The procedure of same set of activities 2) - 7) shall be performed for Grade 12 accordingly to science subject;

12) writing the part of 50 (fifty) Answers with comments (if necessary);

13) Hosting of Information sources after the part of Answers (pages 36-37) accordingly to science subject;

14) Hosting of Vocabulary at the end of the BoP (pages 38-40);

Finally, the BoP of „pdf“ format shall be hosted at www.inovacijos.lt, as well the BoP of „pdf“ format shall be sent by e-mail (as deliverable) for project SPACEOLYMP programme manager.

After producing the final version of the BoP, the BoP shall be splitted into separate BoPs for grades 8, 9, 10, 11 and 12 accordingly. In addition, the BoPs shall be converted to „flipping“ book format.

b) Shape and content of Questionnaire

Shape and content of Questionnaires shall be created and after filled included into Technical Note of each BoP. Questionnaire in case of BoP in Mathematics (Lithuanian version):

KLAUSIMYNAS MATEMATIKOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Matematikos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Matematikos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje matematikos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

All Questionnaires for different science subjects are presented in the Annex Questionnaires.

English version of Questionnaire:
Notice: questionnaire text and structure agreed (or fixed) with Technical officer, Ms. Maite Trujillo.

QUESTIONNAIRE FOR SPECIALISTS OF „X subject“

1) What is your impression about virtual Book of Problems of „X“ in general ? (put sign „+“ in appropriate cell):

	1 (very poor)	2 (poor)	3 (fair)	4 (good)	5 (excellent)
Design					
Structure					
Clarity					

2) Does the tasks correlate with the Lithuanian Education program in „X“? (Please evaluate)

Evaluation	1 (very poor)	2 (poor)	3 (fair)	4 (good)	5 (excellent)
8 grade					
9 grade					
10 grade					
11 grade					
12 grade					

3) What is level of complexity of tasks in the Book of Problems? (Please evaluate)

Evaluation	1 (very poor)	2 (poor)	3 (fair)	4 (good)	5 (excellent)
8 grade					
9 grade					
10 grade					
11 grade					
12 grade					

4) Does the tasks of Book of Problems looks usefull for teacher‘s in „X“ work? (Please evaluate)

Evaluation	1 (very poor)	2 (poor)	3 (fair)	4 (good)	5 (excellent)
8 grade					
9 grade					
10 grade					
11 grade					
12 grade					

5) What is intelligebility of texts and information in the Book of Problems? (Please evaluate)

Evaluation	1 (very poor)	2 (poor)	3 (fair)	4 (good)	5 (excellent)
8 grade					
9 grade					
10 grade					
11 grade					
12 grade					

Your suggestions

Your notices

Your position (put „+“ in appropriate cell)

Contractor	Teacher (school)	Scientist (university)	Previous olympian	Olympian

THANK YOU IN ADVANCE. SPACEOLYMP TEAM.

*- science subject X = MATHEMATICS, PHYSICS, CHEMISTRY, INFORMATICS, BIOLOGY, ASTRONOMY, GEOGRAPHY

c) Questionnaire's (survey) statistics

The questionnaire statistics shall be provided by Contractor in Technical notes after completion of each BoP:

	TE	TE	TE	TE	TE	TE	TE	TE	TE	TE	OL	OL	OL	OL	OL	OL	OL	SC	TE	OL	SC	**Total**
1	**What is your impression about virtual Book of Problems in general?**																					
D	5	5	4	3	5	5	3	5	4	4	4	4	3	3	4	4	4	4	4,3	3,7	4,0	**4,06**
S	4	4	4	4	5	5	4	5	4	4	4	3	3	5	3	4	4	4	4,3	3,7	4,0	**4,06**
C	4	4	3	5	5	4	4	4	4	3	3	4	5	5	3	4	2	2	4,0	3,7	2,0	**3,78**
2	**Does the tasks correlate with the Lithuanian Education program in X-subject's?**																					
8	4	5	4	4	5	5	3	4	4	4	4	5	4	4	4	4	4	4	4,2	4,1	4,0	**4,17**
9	4	5	4	4	5	5	4	5	4	3	3	5	4	4	4	5	4	4	4,3	4,1	4,0	**4,22**
10	5	5	4	4	5	4	3	5	4	4	4	5	4	4	4	4	5	5	4,3	4,3	5,0	**4,33**
11	5	5	4	4	5	4	4	5	4	3	3	5	4	4	4	5	5	5	4,3	4,3	5,0	**4,33**
12	5	5	4	4	5	5	4	5	4	4	4	5	4	4	4	4	4	4	4,5	4,1	4,0	**4,33**
3	**What is level of complexity of tasks in the Book of Problems?**																					
8	5	4	4	4	4	4	3	4	4	3	3	3	5	4	3	4	4	4	3,9	3,7	4,0	**3,83**
9	5	4	4	4	4	4	3	5	4	3	3	3	5	4	3	4	4	4	4,0	3,7	4,0	**3,89**
10	5	4	4	4	4	5	3	5	4	4	4	3	5	4	3	4	4	4	4,2	3,9	4,0	**4,06**
11	5	4	4	4	4	4	3	5	4	2	2	3	5	4	3	4	5	5	3,9	3,7	5,0	**3,89**
12	5	4	4	3	4	3	3	5	4	3	3	3	5	4	3	4	4	4	3,8	3,7	4,0	**3,78**
4	**Does the tasks of Book of Problems looks usefull for teacher's in „X subject" daily work?**																					
8	4	5	3	4	4	4	3	5	4	2	2	5	5	4	3	4	4	4	3,8	3,9	4,0	**3,83**
9	4	4	3	4	4	4	4	5	4	2	2	5	5	4	3	4	4	4	3,8	3,9	4,0	**3,83**
10	4	5	3	4	4	4	3	5	4	3	3	5	5	4	3	4	4	4	3,9	4,0	4,0	**3,94**
11	4	4	3	4	4	4	4	5	4	2	2	5	5	4	3	4	5	5	3,8	4,0	5,0	**3,94**
12	4	4	3	4	4	5	3	5	4	2	2	5	5	4	3	4	4	4	3,8	3,9	4,0	**3,83**
5	**What is intelligebility of texts and information in the Book of Problems?**																					
8	4	5	3	4	5	4	4	4	4	3	3	4	5	5	4	4	3	3	4,0	4,0	3,0	**3,94**
9	4	4	3	4	5	5	3	4	4	3	3	4	5	5	4	4	3	3	3,9	4,0	3,0	**3,89**
10	4	4	3	4	5	4	4	4	4	4	4	4	5	5	4	4	4	4	4,0	4,3	4,0	**4,11**
11	4	4	3	4	5	4	3	4	4	4	4	4	5	5	4	4	4	4	3,9	4,3	4,0	**4,06**
12	4	4	3	4	5	4	4	4	4	3	3	4	5	5	4	4	3	3	3,9	4,0	3,0	**3,89**
																			4,03	**3,96**	**3,96**	**4,00**

Hereinafter the commentary of abbrevations used in survey's statistical table is provided.

Top line:

„TE" – teacher, „OL" – olympian (including former olympians), „SC" – scientist;

Notice: each „TE's", „OL's", „SC's" cells in Excel file has surveyor's Name and Surname in their Comment field.

Cells of grey color with overarching frame means that the person at the same time falls into two groups of respondents, for example, teacher and former participant of science olympiad.

Most left column:

colored cells from 1 to 5 are the numbers of question in the Questionnaire;

„D“ – design, „S“ – structure, „C“ – clarity;

„8“ corresponds to Grade 8, „9“ – Grade 9, „10“ – Grade 10, „11“ – Grade 11, „12“ – Grade 12.

Figures „1“, „2“, „3“, „4“ and „5“ inside table corresponds to the evaluation „very poor‘, „poor“, „fair“, „good“ and „excellent“ respectively.

Right colums „TE“, „OL“, „SC“:

- intersection of lines „D“, „S“, „C“, „8“, „9“, „10“, „11“ and „12“ with columns „TE“, „OL“ and „SC“ are the average evaluations.

For example, the intersection of line „8“ with column „TE“ in Question No. 1 equals to „4,3“ and means the average evaluation of all teachers participated in survey, and so on.

Most right column „Total“:

- Intersection of lines „D“, „S“, „C“, „8“, „9“, „10“, „11“ and „12“ with column „Total“ is the overall average evaluation.

For example, the intersection of line „S“ with column „Total“ in Question No. 1 equals to „4,06“ and means the average evaluation of all survey participants, and so on.

Most right-bottom group of cells (4 figures):

- in column „TE“ the figure means the overall average evaluation of BoP made by Teachers participating in the survey;
- in column „OL“ the figure means the overall average evaluation of BoP made by Olympians participating in the survey;
- in column „SC“ the figure means the overall average evaluation of BoP made by Scientits and/or Specialists participating in the survey;
- in column „Total“ the figure in framed cell means the overall evaluation of BoP made by all survey participants of Subject in Mathematics (or Physics, or Chemistry, or Informatics, or Biology, or Astronomy, or Geography).

d) Consent for participation

Shape and content of „Consent (Teacher‘s, Specialist‘s) for participation in project activities“ shall be created, used for each BoP (Lithuanian version) and included into Technical Note of each BoP:

2014 m. Europos Kosmoso agentūros

„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje“

Nr. AO/1-8108/14/NL/NDe

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto pradžia: **2016 sausio 1 diena**
Projekto trukmė: **2 metai**

SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

Aš, žemiau pasirašęs sutinku dalyvauti projekto „Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“ veikloje, ir ***pagal galimybes***:
teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
teiksiu projekto vykdytojui (el. paštu ar kt.) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Vardas, pavardė	
Darbovietė	
Dalyko pavadinimas	
Mobilaus telefono Nr.	
El. paštas	
LinkedIn, Facebook, Skype, kt.	
Parašas	
Data	

Shape and content of „Consent (Teacher‘s, Specialist‘s) for participation in project activities“ (English version):

European Space Agency - 2014

„1st call for outline proposals under the programme for European Cooperating States (PECS) in Lithuania“

No. AO/1-8108/14/NL/NDe

Contract No.: **4000115691/15/NL/NDe**
Contractor: **Lithuanian Innovation Centre**
Project name: **Increasing Space Motivation for participants of National and International Science Olympiads (SPACEOLYMP)**
Contract duration: **2 years**

Consent to participate in project activities

I, the undersigned, agree to participate in project „Increasing Space Motivation for Participants of National and International Science Olympiads (SPACEOLYMP), and ***under opportunity***:

- shall provide to solve (test, train) the tasks from the Book of Problems created during project SPACEOLYMP for pupils of my subject who participate at school science olympiads, as well as at regional, national and International science olympiads;
- shall provide to Contractor (via e-mail or other) comments, suggestions, recommendations, pupil‘s feedback and comments on the Book of Problems and tasks in it of my taught subject.

Name, Surname	
Workplace (School)	
Subject name	
Mobile phone No.	
E-mail	
LinkedIn, Facebook, Skype, etc.	
Signature	
Date	

e) Invitation to Workshop (lithuanian version)

Vilnius, 2016 birželio 2 d.

K V I E T I M A S

Maloniai Jus kviečiame š.m. birželio 9 dieną dalyvauti Europos kosmoso agentūros ir Lietuvos inovacijų centro vykdomo projekto „Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas (SPACEOLYMP)“ seminare, skirtame aptarti kuriamo virtualaus uždavinyno „Matematika, kosmosas, inovacijos“ problematiką.

Seminaro programa

8:30 – 9:00 – dalyvių registracija, pasisveikinimo kava

9:00 – 10:00 – projekto koordinatoriaus pranešimas apie SPACEOLYMP uždavinyną

10:00 – 10:15 – diskusija, klausimai

10:15 – 11:00 – dalyvaujančių matematikos mokytojų/dėstytojų pasisakymai, nuomonės apie SPACEOLYMP uždavinyną

11:00 – 11:30 – kavos pertrauka

11:30 – 12:15 – dalyvaujančių buvusių Nacionalinių matematikos olimpiadų dalyvių pasisakymai, nuomonės apie SPACEOLYMP uždavinyną

12:15 – 13:00 – baigiamoji diskusija, uždavinyno problematikos aptarimas

13:00 – pietūs (apmokama iš projekto lėšų)

PASTABA: ne vilniečiams kompensuojamos kelionės išlaidos. Būtina pateikti kelionės išlaidas patvirtinantį dokumentą (bilietą), asmens kodą ir sąskaitos numerį į kurią bus pervedamos kompensuojamos išlaidos.

Renginio vieta Vilniuje:

Viešbutis "Shakespeare", Bernardinų g. 8/8, Tel: +370 5 2665885
(greta Švietimo ir mokslo ministerijos); http://www.shakespeare.lt

Projekto SPACEOLYMP koordinatorius,
Lietuvos inovacijų centro projektų konsultantas

Saulius Lapienis
Tel. +370 698 83021

SPACEOLYMP

Invitation to Workshop (English version)

June 2, 2016, Vilnius

I N V I T A T I O N

We kindly invite you to attend on June 9, 2017 the workshop organised by Lithuanian Innovation Centre – the Coordinator of the project „Increasing Space Motivation for Participants of National and International Science Olympiads (SPACEOLYMP)“ funded by European Space Agency. The workshop target is the discussion of the issues of virtual Book of Problems „Mathematics, Space, Innovation“.

Workshop program

8:30 – 9:00 – registracion of participants, welcome coffee

9:00 – 10:00 – presentation of Coordinator of project SPACEOLYMP about the Book of Problems

10:00 – 10:15 – discussion, questions

10:15 – 11:00 – speeches of participating teachers/lecturers in mathematics, reviews for Book of Problems in Mathematics

11:00 – 11:30 – coffee break

11:30 – 12:15 – speeches of participating former Olympians of National Olympiads in Mathematics, reviews for Book of Problems in Mathematics

12:15 – 13:00 – final discussion, issues of Book of Problems

13:00 – lunch (paid from project fund)

NOTICE: reimbursement of travel expenses is possible for non Vilnius residents. It is necessary to provide the travel costs document (ticket), personal identification number and account number to which offset costs will be transferred.

Venue of the event in Vilnius:

Hotel "Shakespeare", Bernardinu str. 8/8, Tel: +370 5 2665885
(close to Ministry of Science and Education); http://www.shakespeare.lt

Coordinator of project SPACEOLYMP,
Project consultant at Lithuanian Innovation centre

Saulius Lapienis
Tel. +370 698 83021

f) Registration of Workshop participants (lithuanian version)

2014 m. Europos Kosmoso agentūros
„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje“
Nr. AO/1-8108/14/NL/NDe

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**

2016 birželio 9 d. seminaro dalyvių sąrašas (matematika)

Eil. Nr.	Vardas, Pavardė	Darbovietė	Tel. numeris	Parašas
1.	*Name, Surname*	*Organization*	*869883021*	*Signature*
2.				
3.				
4.				
5.				
6.				
7.				
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17.				
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19.				
20.				
21.				

g) Materials of Workshop

Logistics and content of the Workshop shall conform the following requirements:

a) logistics:

- selection and invitation of Workshop participants;
- registration of Workshop participants;
- brief presentation of project by Coordinator;
- statements of teachers;
- statements of previous Olympians;

b) content:

- brief presentation of SPACEOLYMP, especially for workshop participants not participated at National Science Olympiads in 2016;
- overview of Book of Problems of particular science subject;
- overview of other exercise books for pupils, eg. NASA;
- selected samples of problems for grades 8, 9, 10, 11, 12 (one per grade) from NASA BoP;
- new possibilities creating problems with Google Earth, -Moon, -Mars, -Sky;
- brief introduction about new space-related areas:
  - i) h-geometry;
  - ii) reusable launch system of Space-X;
  - ii) constellation of Sentinel satellites;
- consideration of one Problem from newly created BoP;
- analysis of Questionnaire about newly created BoP;
- observation, reaction, opinion of:
  - i) pupils-olympians;
  - ii) previous participants of Science Olympiads;
  - iii) teachers;
  - iv) scientists or specialists;
- summary of Questionnaire (survey on BoP);

VII. Conclusions

Providing project SPACEOLYMP the Lithuanian Innovation Centre as Contractor did not itemized description of how the materials of project will be developed. Even after the Minutes of Meeting held on October 30, 2015 this was not done. Until now, the space topic of problems for pupils existed only in NASA website, but the tasks has been long enough, there were no clear links with STEM, and the problems were weakly associated with real events.

The Contractor found that it is useful to prepare the Methodological material which shall indicate STEM-related:

- structure of Problems, Questions and Answers;
- information sources;
- design of Book of Problems;
- structure of reporting (Technical Notes);
- distribution of project materials and results.

Prepared Books of Problems according to the methodology will be exclusively applied by forming pupils‘ STEM understanding. The Books of Problems includes daily space history, at the end the Space Calendar was designed. In order of facilitation the preparation of content of Books of Problems, the Catalogue of Space events was created. The Books of Problems shall be prepared in several formats – docx, pdf, flipping books. Also the Books of Problems could be downloadable to mobile devices.

Developed BoP system distributed by grades (classes) is acceptable for teachers and pupils of various science subjects, and created BoP template system could serve as background for selffillable BoPs by teachers, olympians, specialists.

Contractor proposed a way to complete the result of SPACEOLYMP in one page using the table of QR codes (see page 48).

The Methodological material allows at anytime, for any person from any country at least in english language to create the tasks for Books of Problems by choice or demand.

Annex M

BoP in Mathematics – Grade 8

M-8.1	Telescope	Earth	Temperature	NASA	Time	Physics	STEM
M-8.2	Astronaut	Moon	Mass	ESA	Period	Chemistry	
M-8.3	Robot	Mars	Gravity	Roscosmos	Angle	Informatics	
M-8.4	Rocket	Planet	Atmosphere	JAXA	Coordinate	Biology	
M-8.5	Shuttle	Sun	Frequency	CNSA	Trajectory	Astronomy	
M-8.6	ISS	Comet	Radiation	ISRO	Orbit	Geography	
M-8.7	Cubesat	Asteroide	Wave	CNES	Distance	Physics	
M-8.8	Satellite	Meteorite	Magnetism	DLR	Velocity	Chemistry	
M-8.9	Rover	Earth	Temperature	ESA	Period	Informatics	
M-8.10	Probe	Moon	Mass	Roscosmos	Angle	Biology	

BoP in Mathematics – Grade 9

M-9.1	Telescope	Mars	Gravity	JAXA	Coordinate	Astronomy	STEM
M-9.2	Astronaut	Earth	Atmosphere	CNSA	Trajectory	Geography	
M-9.3	Robot	Moon	Frequency	ISRO	Orbit	Physics	
M-9.4	Rocket	Mars	Radiation	CNES	Distance	Chemistry	
M-9.5	Shuttle	Planet	Wave	DLR	Velocity	Informatics	
M-9.6	ISS	Sun	Magnetism	NASA	Time	Biology	
M-9.7	Cubesat	Comet	Temperature	ESA	Angle	Astronomy	
M-9.8	Satellite	Asteroide	Mass	Roscosmos	Coordinate	Geography	
M-9.9	Rover	Meteorite	Gravity	JAXA	Trajectory	Physics	
M-9.10	Probe	Earth	Atmosphere	NASA	Orbit	Chemistry	

BoP in Mathematics – Grade 10

M-10.1	Telescope	Moon	Frequency	ESA	Distance	Informatics	STEM
M-10.2	Astronaut	Mars	Radiation	Roscosmos	Velocity	Biology	
M-10.3	Robot	Earth	Wave	JAXA	Time	Astronomy	
M-10.4	Rocket	Moon	Magnetism	CNSA	Period	Geography	
M-10.5	Shuttle	Mars	Temperature	ISRO	Coordinate	Physics	
M-10.6	ISS	Planet	Mass	CNES	Trajectory	Chemistry	
M-10.7	Cubesat	Sun	Gravity	DLR	Orbit	Informatics	
M-10.8	Satellite	Comet	Atmosphere	NASA	Distance	Biology	
M-10.9	Rover	Asteroide	Frequency	ESA	Velocity	Astronomy	
M-10.10	Probe	Meteorite	Radiation	Roscosmos	Time	Geography	

BoP in Mathematics – Grade 11

M-11.1	Telescope	Earth	Wave	JAXA	Period	Physics	STEM
M-11.2	Astronaut	Moon	Magnetism	CNSA	Angle	Chemistry	
M-11.3	Robot	Mars	Temperature	NASA	Trajectory	Informatics	
M-11.4	Rocket	Earth	Mass	ESA	Orbit	Biology	
M-11.5	Shuttle	Moon	Gravity	Roscosmos	Distance	Astronomy	
M-11.6	ISS	Mars	Atmosphere	JAXA	Velocity	Geography	
M-11.7	Cubesat	Planet	Frequency	CNSA	Time	Physics	
M-11.8	Satellite	Sun	Radiation	ISRO	Period	Chemistry	
M-11.9	Rover	Comet	Wave	CNES	Angle	Informatics	
M-11.10	Probe	Asteroide	Magnetism	DLR	Coordinate	Biology	

BoP in Mathematics – Grade 12

M-12.1	Telescope	Meteorite	Temperature	ESA	Orbit	Astronomy	STEM
M-12.2	Astronaut	Earth	Mass	Roscosmos	Distance	Geography	
M-12.3	Robot	Moon	Gravity	JAXA	Velocity	Physics	
M-12.4	Rocket	Mars	Atmosphere	CNSA	Time	Chemistry	
M-12.5	Shuttle	Earth	Frequency	ISRO	Period	Informatics	
M-12.6	ISS	Moon	Radiation	NASA	Angle	Biology	
M-12.7	Cubesat	Mars	Wave	ESA	Coordinate	Astronomy	
M-12.8	Satellite	Planet	Magnetism	Roscosmos	Trajectory	Geography	
M-12.9	Rover	Sun	Temperature	JAXA	Distance	Physics	
M-12.10	Probe	Comet	Mass	CNSA	Velocity	Chemistry	

ESA Contract No. 4000115691/15/NL/NDe

Annex P

BoP in Physics – Grade 8

P-8.1	Telescope	Asteroide	Gravity	ISRO	Time	Informatics	STEM
P-8.2	Astronaut	Meteorite	Atmosphere	CNES	Period	Biology	
P-8.3	Robot	Earth	Frequency	DLR	Angle	Astronomy	
P-8.4	Rocket	Moon	Radiation	Roscosmos	Coordinate	Geography	
P-8.5	Shuttle	Mars	Wave	JAXA	Trajectory	Mathematics	
P-8.6	ISS	Earth	Magnetism	CNSA	Orbit	Chemistry	
P-8.7	Cubesat	Moon	Temperature	ISRO	Velocity	Informatics	
P-8.8	Satellite	Mars	Mass	CNES	Time	Biology	
P-8.9	Rover	Planet	Gravity	NASA	Period	Astronomy	
P-8.10	Probe	Sun	Atmosphere	ESA	Angle	Geography	

BoP in Physics – Grade 9

P-9.1	Telescope	Comet	Frequency	Roscosmos	Coordinate	Mathematics	STEM
P-9.2	Astronaut	Asteroide	Radiation	JAXA	Trajectory	Chemistry	
P-9.3	Robot	Meteorite	Wave	CNSA	Orbit	Informatics	
P-9.4	Rocket	Earth	Magnetism	ISRO	Distance	Biology	
P-9.5	Shuttle	Moon	Mass	CNES	Time	Astronomy	
P-9.6	ISS	Mars	Gravity	DLR	Period	Geography	
P-9.7	Cubesat	Earth	Atmosphere	JAXA	Angle	Mathematics	
P-9.8	Satellite	Moon	Frequency	CNSA	Coordinate	Chemistry	
P-9.9	Rover	Mars	Radiation	ISRO	Trajectory	Informatics	
P-9.10	Probe	Planet	Wave	CNES	Orbit	Biology	

BoP in Physics – Grade 10

P-10.1	Telescope	Sun	Magnetism	DLR	Distance	Astronomy	STEM
P-10.2	Astronaut	Comet	Temperature	NASA	Velocity	Geography	
P-10.3	Robot	Asteroide	Mass	ESA	Angle	Mathematics	
P-10.4	Rocket	Meteorite	Gravity	Roscosmos	Coordinate	Chemistry	
P-10.5	Shuttle	Earth	Atmosphere	JAXA	Trajectory	Informatics	
P-10.6	ISS	Moon	Frequency	CNSA	Orbit	Biology	
P-10.7	Cubesat	Mars	Radiation	ISRO	Distance	Astronomy	
P-10.8	Satellite	Earth	Wave	CNES	Velocity	Geography	
P-10.9	Rover	Moon	Magnetism	DLR	Time	Mathematics	
P-10.10	Probe	Mars	Temperature	CNSA	Period	Chemistry	

BoP in Physics – Grade 11

P-11.1	Telescope	Planet	Mass	ISRO	Coordinate	Informatics	STEM
P-11.2	Astronaut	Sun	Gravity	CNES	Trajectory	Biology	
P-11.3	Robot	Comet	Atmosphere	DLR	Orbit	Astronomy	
P-11.4	Rocket	Asteroide	Frequency	NASA	Distance	Geography	
P-11.5	Shuttle	Meteorite	Radiation	NASA	Velocity	Mathematics	
P-11.6	ISS	Earth	Wave	ESA	Time	Chemistry	
P-11.7	Cubesat	Moon	Magnetism	Roscosmos	Period	Informatics	
P-11.8	Satellite	Mars	Temperature	JAXA	Angle	Biology	
P-11.9	Rover	Earth	Mass	CNSA	Trajectory	Astronomy	
P-11.10	Probe	Moon	Gravity	ISRO	Orbit	Geography	

BoP in Physics – Grade 12

P-12.1	Telescope	Mars	Atmosphere	CNES	Distance	Mathematics	STEM
P-12.2	Astronaut	Planet	Frequency	DLR	Velocity	Chemistry	
P-12.3	Robot	Sun	Radiation	ISRO	Time	Informatics	
P-12.4	Rocket	Comet	Wave	CNES	Period	Biology	
P-12.5	Shuttle	Asteroide	Magnetism	DLR	Angle	Astronomy	
P-12.6	ISS	Meteorite	Temperature	NASA	Coordinate	Geography	
P-12.7	Cubesat	Earth	Mass	ESA	Orbit	Mathematics	
P-12.8	Satellite	Moon	Gravity	NASA	Distance	Chemistry	
P-12.9	Rover	Mars	Atmosphere	ESA	Velocity	Informatics	
P-12.10	Probe	Earth	Frequency	Roscosmos	Time	Biology	

ESA Contract No. 4000115691/15/NL/NDe

Annex C

BoP in Chemistry – Grade 8

C-8.1	Telescope	Moon	Radiation	JAXA	Period	Astronomy	STEM
C-8.2	Astronaut	Mars	Wave	CNSA	Angle	Geography	
C-8.3	Robot	Planet	Magnetism	ISRO	Coordinate	Mathematics	
C-8.4	Rocket	Sun	Temperature	CNES	Trajectory	Physics	
C-8.5	Shuttle	Comet	Mass	DLR	Distance	Informatics	
C-8.6	ISS	Asteroide	Gravity	CNES	Velocity	Biology	
C-8.7	Cubesat	Meteorite	Atmosphere	DLR	Time	Astronomy	
C-8.8	Satellite	Earth	Frequency	NASA	Period	Geography	
C-8.9	Rover	Moon	Radiation	ESA	Angle	Mathematics	
C-8.10	Probe	Mars	Wave	Roscosmos	Coordinate	Physics	

BoP in Chemistry – Grade 9

C-9.1	Telescope	Planet	Magnetism	NASA	Trajectory	Informatics	STEM
C-9.2	Astronaut	Sun	Temperature	ESA	Orbit	Biology	
C-9.3	Robot	Comet	Mass	Roscosmos	Velocity	Astronomy	
C-9.4	Rocket	Asteroide	Gravity	JAXA	Time	Geography	
C-9.5	Shuttle	Meteorite	Atmosphere	CNSA	Period	Mathematics	
C-9.6	ISS	Earth	Frequency	ISRO	Angle	Physics	
C-9.7	Cubesat	Moon	Radiation	CNES	Coordinate	Informatics	
C-9.8	Satellite	Mars	Wave	DLR	Trajectory	Biology	
C-9.9	Rover	Planet	Magnetism	DLR	Orbit	Astronomy	
C-9.10	Probe	Sun	Temperature	NASA	Distance	Geography	

BoP in Chemistry – Grade 10

C-10.1	Telescope	Comet	Gravity	ESA	Time	Mathematics	STEM
C-10.2	Astronaut	Planet	Atmosphere	Roscosmos	Period	Physics	
C-10.3	Robot	Sun	Frequency	JAXA	Angle	Informatics	
C-10.4	Rocket	Comet	Radiation	NASA	Coordinate	Biology	
C-10.5	Shuttle	Asteroide	Wave	ESA	Trajectory	Astronomy	
C-10.6	ISS	Meteorite	Magnetism	Roscosmos	Orbit	Geography	
C-10.7	Cubesat	Earth	Temperature	JAXA	Distance	Mathematics	
C-10.8	Satellite	Moon	Mass	CNSA	Velocity	Physics	
C-10.9	Rover	Mars	Gravity	ISRO	Period	Informatics	
C-10.10	Probe	Planet	Atmosphere	CNES	Angle	Biology	

BoP in Chemistry – Grade 11

C-11.1	Telescope	Sun	Frequency	DLR	Coordinate	Astronomy	STEM
C-11.2	Astronaut	Comet	Radiation	NASA	Trajectory	Geography	
C-11.3	Robot	Planet	Wave	ESA	Orbit	Mathematics	
C-11.4	Rocket	Sun	Magnetism	Roscosmos	Distance	Physics	
C-11.5	Shuttle	Comet	Temperature	JAXA	Velocity	Informatics	
C-11.6	ISS	Asteroide	Mass	CNSA	Time	Biology	
C-11.7	Cubesat	Meteorite	Gravity	NASA	Coordinate	Astronomy	
C-11.8	Satellite	Earth	Atmosphere	ESA	Trajectory	Geography	
C-11.9	Rover	Moon	Frequency	Roscosmos	Orbit	Mathematics	
C-11.10	Probe	Mars	Radiation	JAXA	Distance	Physics	

BoP in Chemistry – Grade 12

C-12.1	Telescope	Planet	Wave	CNSA	Velocity	Informatics	STEM
C-12.2	Astronaut	Sun	Magnetism	ISRO	Time	Biology	
C-12.3	Robot	Comet	Temperature	CNES	Period	Astronomy	
C-12.4	Rocket	Planet	Mass	DLR	Angle	Geography	
C-12.5	Shuttle	Sun	Gravity	ESA	Trajectory	Mathematics	
C-12.6	ISS	Comet	Atmosphere	Roscosmos	Orbit	Physics	
C-12.7	Cubesat	Asteroide	Frequency	JAXA	Distance	Informatics	
C-12.8	Satellite	Meteorite	Radiation	CNSA	Velocity	Biology	
C-12.9	Rover	Earth	Wave	ISRO	Time	Astronomy	
C-12.10	Probe	Moon	Magnetism	NASA	Period	Geography	

Annex I

BoP in Informatics – Grade 8

I-8.1	Telescope	Mars	Temperature	ESA	Angle	Mathematics	STEM
I-8.2	Astronaut	Planet	Mass	Roscosmos	Coordinate	Physics	
I-8.3	Robot	Sun	Gravity	JAXA	Orbit	Chemistry	
I-8.4	Rocket	Comet	Atmosphere	CNSA	Distance	Biology	
I-8.5	Shuttle	Planet	Frequency	ISRO	Velocity	Astronomy	
I-8.6	ISS	Sun	Radiation	CNES	Time	Geography	
I-8.7	Cubesat	Comet	Wave	DLR	Period	Mathematics	
I-8.8	Satellite	Asteroide	Magnetism	Roscosmos	Angle	Physics	
I-8.9	Rover	Meteorite	Temperature	JAXA	Coordinate	Chemistry	
I-8.10	Probe	Earth	Mass	CNSA	Trajectory	Biology	

BoP in Informatics – Grade 9

I-9.1	Telescope	Moon	Gravity	ISRO	Distance	Astronomy	STEM
I-9.2	Astronaut	Mars	Atmosphere	CNES	Velocity	Geography	
I-9.3	Robot	Planet	Frequency	NASA	Time	Mathematics	
I-9.4	Rocket	Sun	Radiation	ESA	Period	Physics	
I-9.5	Shuttle	Comet	Wave	Roscosmos	Angle	Chemistry	
I-9.6	ISS	Planet	Magnetism	JAXA	Coordinate	Biology	
I-9.7	Cubesat	Sun	Temperature	CNSA	Trajectory	Astronomy	
I-9.8	Satellite	Comet	Mass	ISRO	Orbit	Geography	
I-9.9	Rover	Asteroide	Gravity	CNES	Velocity	Mathematics	
I-9.10	Probe	Meteorite	Atmosphere	DLR	Time	Physics	

BoP in Informatics – Grade 10

I-10.1	Telescope	Earth	Frequency	JAXA	Period	Chemistry	STEM
I-10.2	Astronaut	Moon	Radiation	CNSA	Angle	Biology	
I-10.3	Robot	Mars	Wave	ISRO	Coordinate	Astronomy	
I-10.4	Rocket	Planet	Magnetism	CNES	Trajectory	Geography	
I-10.5	Shuttle	Sun	Temperature	DLR	Orbit	Mathematics	
I-10.6	ISS	Comet	Mass	NASA	Distance	Physics	
I-10.7	Cubesat	Planet	Atmosphere	ESA	Time	Chemistry	
I-10.8	Satellite	Sun	Frequency	Roscosmos	Period	Biology	
I-10.9	Rover	Comet	Radiation	JAXA	Angle	Astronomy	
I-10.10	Probe	Asteroide	Wave	CNSA	Coordinate	Geography	

BoP in Informatics – Grade 11

I-11.1	Telescope	Meteorite	Magnetism	ISRO	Trajectory	Mathematics	STEM
I-11.2	Astronaut	Earth	Temperature	CNES	Orbit	Physics	
I-11.3	Robot	Moon	Mass	DLR	Distance	Chemistry	
I-11.4	Rocket	Mars	Gravity	CNSA	Velocity	Biology	
I-11.5	Shuttle	Planet	Atmosphere	ISRO	Period	Astronomy	
I-11.6	ISS	Sun	Frequency	CNES	Angle	Geography	
I-11.7	Cubesat	Comet	Radiation	DLR	Coordinate	Mathematics	
I-11.8	Satellite	Planet	Wave	NASA	Trajectory	Physics	
I-11.9	Rover	Sun	Magnetism	NASA	Orbit	Chemistry	
I-11.10	Probe	Comet	Temperature	ESA	Distance	Biology	

BoP in Informatics – Grade 12

I-12.1	Telescope	Asteroide	Mass	Roscosmos	Velocity	Astronomy	STEM
I-12.2	Astronaut	Meteorite	Gravity	JAXA	Time	Geography	
I-12.3	Robot	Earth	Atmosphere	CNSA	Trajectory	Mathematics	
I-12.4	Rocket	Moon	Frequency	ISRO	Orbit	Physics	
I-12.5	Shuttle	Mars	Radiation	CNES	Distance	Chemistry	
I-12.6	ISS	Planet	Wave	DLR	Velocity	Biology	
I-12.7	Cubesat	Sun	Magnetism	CNES	Time	Astronomy	
I-12.8	Satellite	Comet	Temperature	DLR	Period	Geography	
I-12.9	Rover	Planet	Mass	NASA	Angle	Mathematics	
I-12.10	Probe	Sun	Gravity	ESA	Coordinate	Physics	

Annex B

BoP in Biology – Grade 8

B-8.1	Telescope	Comet	Atmosphere	Roscosmos	Orbit	Chemistry	STEM
B-8.2	Astronaut	Asteroide	Frequency	NASA	Distance	Informatics	
B-8.3	Robot	Meteorite	Radiation	ESA	Velocity	Astronomy	
B-8.4	Rocket	Earth	Wave	Roscosmos	Time	Geography	
B-8.5	Shuttle	Moon	Magnetism	JAXA	Period	Mathematics	
B-8.6	ISS	Mars	Temperature	CNSA	Angle	Physics	
B-8.7	Cubesat	Planet	Mass	ISRO	Coordinate	Chemistry	
B-8.8	Satellite	Sun	Gravity	CNES	Trajectory	Informatics	
B-8.9	Rover	Comet	Atmosphere	DLR	Distance	Astronomy	
B-8.10	Probe	Planet	Frequency	ISRO	Velocity	Geography	

BoP in Biology – Grade 9

B-9.1	Telescope	Sun	Radiation	DLR	Time	Mathematics	STEM
B-9.2	Astronaut	Comet	Wave	NASA	Period	Physics	
B-9.3	Robot	Asteroide	Magnetism	ESA	Angle	Chemistry	
B-9.4	Rocket	Meteorite	Temperature	Roscosmos	Coordinate	Informatics	
B-9.5	Shuttle	Earth	Mass	NASA	Trajectory	Astronomy	
B-9.6	ISS	Moon	Gravity	ESA	Orbit	Geography	
B-9.7	Cubesat	Mars	Atmosphere	Roscosmos	Velocity	Mathematics	
B-9.8	Satellite	Planet	Frequency	JAXA	Time	Physics	
B-9.9	Rover	Sun	Radiation	CNSA	Period	Chemistry	
B-9.10	Probe	Comet	Wave	ISRO	Angle	Informatics	

BoP in Biology – Grade 10

B-10.1	Telescope	Asteroide	Magnetism	CNES	Coordinate	Astronomy	STEM
B-10.2	Astronaut	Meteorite	Temperature	DLR	Trajectory	Geography	
B-10.3	Robot	Earth	Mass	CNES	Orbit	Mathematics	
B-10.4	Rocket	Moon	Gravity	ESA	Distance	Physics	
B-10.5	Shuttle	Mars	Frequency	Roscosmos	Time	Chemistry	
B-10.6	ISS	Planet	Radiation	JAXA	Period	Informatics	
B-10.7	Cubesat	Sun	Wave	CNSA	Angle	Astronomy	
B-10.8	Satellite	Comet	Magnetism	NASA	Coordinate	Geography	
B-10.9	Rover	Asteroide	Temperature	ESA	Trajectory	Mathematics	
B-10.10	Probe	Meteorite	Mass	Roscosmos	Orbit	Physics	

BoP in Biology – Grade 11

B-11.1	Telescope	Earth	Gravity	JAXA	Distance	Chemistry	STEM
B-11.2	Astronaut	Asteroide	Atmosphere	CNSA	Velocity	Informatics	
B-11.3	Robot	Meteorite	Frequency	ISRO	Period	Astronomy	
B-11.4	Rocket	Earth	Radiation	CNES	Angle	Geography	
B-11.5	Shuttle	Moon	Wave	DLR	Coordinate	Mathematics	
B-11.6	ISS	Mars	Magnetism	DLR	Trajectory	Physics	
B-11.7	Cubesat	Planet	Temperature	Roscosmos	Orbit	Chemistry	
B-11.8	Satellite	Sun	Mass	JAXA	Distance	Informatics	
B-11.9	Rover	Comet	Gravity	CNSA	Velocity	Astronomy	
B-11.10	Probe	Asteroide	Atmosphere	ISRO	Time	Geography	

BoP in Biology – Grade 12

B-12.1	Telescope	Meteorite	Frequency	NASA	Angle	Mathematics	STEM
B-12.2	Astronaut	Earth	Radiation	ESA	Coordinate	Physics	
B-12.3	Robot	Asteroide	Wave	Roscosmos	Trajectory	Chemistry	
B-12.4	Rocket	Meteorite	Magnetism	JAXA	Orbit	Informatics	
B-12.5	Shuttle	Earth	Temperature	CNSA	Distance	Astronomy	
B-12.6	ISS	Moon	Mass	ISRO	Velocity	Geography	
B-12.7	Cubesat	Mars	Gravity	CNES	Time	Mathematics	
B-12.8	Satellite	Planet	Atmosphere	DLR	Period	Physics	
B-12.9	Rover	Sun	Frequency	NASA	Coordinate	Chemistry	
B-12.10	Probe	Comet	Radiation	JAXA	Trajectory	Informatics	

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Annex A

BoP in Astronomy – Grade 8

A-8.1	Telescope	Asteroide	Wave	CNSA	Orbit	Biology	STEM
A-8.2	Astronaut	Meteorite	Magnetism	ISRO	Distance	Geography	
A-8.3	Robot	Earth	Temperature	CNES	Velocity	Mathematics	
A-8.4	Rocket	Asteroide	Mass	NASA	Time	Physics	
A-8.5	Shuttle	Meteorite	Gravity	ESA	Period	Chemistry	
A-8.6	ISS	Earth	Atmosphere	Roscosmos	Angle	Informatics	
A-8.7	Cubesat	Moon	Frequency	JAXA	Orbit	Biology	
A-8.8	Satellite	Mars	Radiation	CNSA	Distance	Geography	
A-8.9	Rover	Planet	Wave	ISRO	Velocity	Mathematics	
A-8.10	Probe	Sun	Magnetism	CNES	Time	Physics	

BoP in Astronomy – Grade 9

A-9.1	Telescope	Comet	Temperature	DLR	Period	Chemistry	STEM
A-9.2	Astronaut	Asteroide	Mass	ESA	Angle	Informatics	
A-9.3	Robot	Meteorite	Gravity	CNSA	Coordinate	Biology	
A-9.4	Rocket	Earth	Atmosphere	ISRO	Trajectory	Geography	
A-9.5	Shuttle	Asteroide	Frequency	CNES	Distance	Mathematics	
A-9.6	ISS	Meteorite	Radiation	DLR	Velocity	Physics	
A-9.7	Cubesat	Earth	Wave	NASA	Time	Chemistry	
A-9.8	Satellite	Moon	Magnetism	ESA	Period	Informatics	
A-9.9	Rover	Mars	Temperature	Roscosmos	Angle	Biology	
A-9.10	Probe	Planet	Mass	JAXA	Coordinate	Geography	

BoP in Astronomy – Grade 10

A-10.1	Telescope	Sun	Gravity	CNSA	Trajectory	Mathematics	STEM
A-10.2	Astronaut	Comet	Atmosphere	ISRO	Distance	Physics	
A-10.3	Robot	Asteroide	Frequency	CNES	Velocity	Chemistry	
A-10.4	Rocket	Meteorite	Radiation	DLR	Time	Informatics	
A-10.5	Shuttle	Earth	Wave	Roscosmos	Period	Biology	
A-10.6	ISS	Asteroide	Magnetism	ISRO	Angle	Geography	
A-10.7	Cubesat	Meteorite	Temperature	CNES	Coordinate	Mathematics	
A-10.8	Satellite	Earth	Mass	DLR	Trajectory	Physics	
A-10.9	Rover	Moon	Gravity	NASA	Orbit	Chemistry	
A-10.10	Probe	Mars	Atmosphere	NASA	Distance	Informatics	

BoP in Astronomy – Grade 11

A-11.1	Telescope	Planet	Radiation	ESA	Time	Biology	STEM
A-11.2	Astronaut	Sun	Wave	Roscosmos	Period	Geography	
A-11.3	Robot	Comet	Magnetism	JAXA	Angle	Mathematics	
A-11.4	Rocket	Asteroide	Temperature	CNSA	Coordinate	Physics	
A-11.5	Shuttle	Meteorite	Mass	ISRO	Trajectory	Chemistry	
A-11.6	ISS	Earth	Gravity	CNES	Orbit	Informatics	
A-11.7	Cubesat	Asteroide	Atmosphere	DLR	Distance	Biology	
A-11.8	Satellite	Meteorite	Frequency	JAXA	Velocity	Geography	
A-11.9	Rover	Earth	Radiation	CNES	Period	Mathematics	
A-11.10	Probe	Moon	Wave	DLR	Angle	Physics	

BoP in Astronomy – Grade 12

A-12.1	Telescope	Mars	Magnetism	NASA	Coordinate	Chemistry	STEM
A-12.2	Astronaut	Planet	Temperature	ESA	Trajectory	Informatics	
A-12.3	Robot	Sun	Mass	NASA	Orbit	Biology	
A-12.4	Rocket	Comet	Gravity	ESA	Distance	Geography	
A-12.5	Shuttle	Asteroide	Atmosphere	Roscosmos	Velocity	Mathematics	
A-12.6	ISS	Meteorite	Frequency	JAXA	Time	Physics	
A-12.7	Cubesat	Earth	Radiation	CNSA	Angle	Chemistry	
A-12.8	Satellite	Asteroide	Wave	ISRO	Coordinate	Informatics	
A-12.9	Rover	Meteorite	Magnetism	CNES	Trajectory	Biology	
A-12.10	Probe	Earth	Temperature	DLR	Orbit	Geography	

Annex G

BoP in Geography – Grade 8

G-8.1	Telescope	Moon	Mass	CNSA	Distance	Mathematics	STEM
G-8.2	Astronaut	Mars	Gravity	DLR	Velocity	Physics	
G-8.3	Robot	Planet	Atmosphere	NASA	Time	Chemistry	
G-8.4	Rocket	Sun	Frequency	ESA	Period	Informatics	
G-8.5	Shuttle	Comet	Radiation	Roscosmos	Coordinate	Biology	
G-8.6	ISS	Asteroide	Wave	NASA	Trajectory	Astronomy	
G-8.7	Cubesat	Meteorite	Magnetism	ESA	Orbit	Mathematics	
G-8.8	Satellite	Earth	Temperature	Roscosmos	Distance	Physics	
G-8.9	Rover	Asteroide	Mass	JAXA	Velocity	Chemistry	
G-8.10	Probe	Meteorite	Gravity	CNSA	Time	Informatics	

BoP in Geography – Grade 9

G-9.1	Telescope	Earth	Atmosphere	ISRO	Period	Biology	STEM
G-9.2	Astronaut	Moon	Frequency	CNES	Angle	Astronomy	
G-9.3	Robot	Mars	Radiation	DLR	Trajectory	Mathematics	
G-9.4	Rocket	Planet	Wave	ISRO	Orbit	Physics	
G-9.5	Shuttle	Sun	Magnetism	NASA	Distance	Chemistry	
G-9.6	ISS	Comet	Temperature	ESA	Velocity	Informatics	
G-9.7	Cubesat	Asteroide	Mass	Roscosmos	Time	Biology	
G-9.8	Satellite	Meteorite	Gravity	JAXA	Period	Astronomy	
G-9.9	Rover	Earth	Atmosphere	NASA	Angle	Mathematics	
G-9.10	Probe	Asteroide	Frequency	ESA	Coordinate	Physics	

BoP in Geography – Grade 10

G-10.1	Telescope	Meteorite	Radiation	Roscosmos	Distance	Chemistry	STEM
G-10.2	Astronaut	Earth	Wave	JAXA	Velocity	Informatics	
G-10.3	Robot	Moon	Magnetism	CNSA	Time	Biology	
G-10.4	Rocket	Mars	Temperature	ISRO	Period	Astronomy	
G-10.5	Shuttle	Planet	Mass	CNES	Angle	Mathematics	
G-10.6	ISS	Sun	Gravity	DLR	Coordinate	Physics	
G-10.7	Cubesat	Comet	Atmosphere	CNES	Trajectory	Chemistry	
G-10.8	Satellite	Asteroide	Frequency	ESA	Orbit	Informatics	
G-10.9	Rover	Meteorite	Radiation	Roscosmos	Velocity	Biology	
G-10.10	Probe	Earth	Wave	JAXA	Time	Astronomy	

BoP in Geography – Grade 11

G-11.1	Telescope	Moon	Magnetism	CNSA	Period	Mathematics	STEM
G-11.2	Astronaut	Mars	Temperature	NASA	Angle	Physics	
G-11.3	Robot	Planet	Mass	ESA	Coordinate	Chemistry	
G-11.4	Rocket	Sun	Gravity	Roscosmos	Trajectory	Informatics	
G-11.5	Shuttle	Comet	Atmosphere	JAXA	Orbit	Biology	
G-11.6	ISS	Asteroide	Frequency	CNSA	Distance	Astronomy	
G-11.7	Cubesat	Meteorite	Wave	ISRO	Time	Mathematics	
G-11.8	Satellite	Earth	Magnetism	CNES	Time	Physics	
G-11.9	Rover	Moon	Temperature	DLR	Period	Chemistry	
G-11.10	Probe	Mars	Mass	DLR	Angle	Informatics	

BoP in Geography – Grade 12

G-12.1	Telescope	Planet	Gravity	Roscosmos	Coordinate	Biology	STEM
G-12.2	Astronaut	Moon	Atmosphere	JAXA	Trajectory	Astronomy	
G-12.3	Robot	Mars	Frequency	CNSA	Orbit	Mathematics	
G-12.4	Rocket	Planet	Radiation	ISRO	Distance	Physics	
G-12.5	Shuttle	Sun	Wave	NASA	Period	Chemistry	
G-12.6	ISS	Comet	Magnetism	ESA	Angle	Informatics	
G-12.7	Cubesat	Asteroide	Temperature	Roscosmos	Coordinate	Biology	
G-12.8	Satellite	Meteorite	Mass	JAXA	Trajectory	Astronomy	
G-12.9	Rover	Earth	Gravity	CNSA	Orbit	Mathematics	
G-12.10	Probe	Moon	Atmosphere	ISRO	Distance	Physics	

Annex Problem

M-10.1 – **Problem No. 21**

Telescope	Moon	Frequency	ESA	Distance	Informatics

In the Spanish island of Tenerife at the sea level of 2400 m the ESA's Optical ground Station is functioning. In 2001 in the station has been installed the Space Debris Telescope of European Space Agency. Space debris is calculated once per month. This is done during every New moon by directing the telesescope towards very center of the Moon. At this moment only the Earth illuminates the Lunar disk, on which is observed any debris of 10 cm in diameter revolving inside the geostationary ring. Geostacionary ring is the Space segment located 75 km below and 75 km above the geostacionary orbit and between -15 and +15 degrees of declination. In astronomy declination is one of the two equatorial coordinate system's coordinates.

October 18, 2013 is a historic day, because it could be considered as the foundation Day of the Interplanetary Internet. This day NASA has reached the World Internet connection record when sent the information embedded in laser beam at a speed of 622 Mbit/s towards NASA satellite orbiting the Moon and returned backwards the same information at a speed of 20 Mbit/s. On October 26, 2013 the ESA's Optical ground station repeated the same experiment and received the information from the same 400000 km distantly situated NASA satellite at a speed of 40 Mbit/s.

For more information visit this webpage.

Question (A):

Let's imagine two imaginary spheres surrounding the Earth. Closest to Earth sphere virtually passes the lowest point of the geostationary ring and farthest from Earth sphere - highest. How much surface of farthest sphere is greater (in percentages) than surface of closest sphere, if the distance to geostationary orbit equals to 35786 km?

Notice: diameter of Earth equals to 12742 km.

Question compiler: Saulius Lapienis, project consultant at Lithuanian Innovation Centre

Annex LituanicaSAT-1

Annex
SPACEOLYMP

Project presentation

LIETUVOS INOVACIJŲ CENTRAS

Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas

SPACEOLYMP

2016.01.01 - 2017.12.31

LIETUVOS MOKINIŲ NEFORMALIOJO ŠVIETIMO CENTRAS

Projekto dalyvio atmintinė
2016-03-01

LITHUANIAN INNOVATION CENTRE

esa

NASA

Iššūkiai

1) Informatika - programinė įranga (software);
2) Dirbtinė biologija;
3) Naujos kartos ryšiai (optika - lazeriai);
4) Naujos ir sumanios ("smart") medžiagos;
5) Adaptuotos (kitaip pritaikytos) medžiagos;
6) Aero-kosmoso duomenų gavyba ("data mining");
7) Televizija + Internetas iš Kosmoso;
8) Sistemos "Oras-Kosmosas-Oras";
9) Miniatiūrinės technologijos;

LIETUVOS INOVACIJŲ CENTRAS

esa

Projekto veiklos

LIETUVOS MOKINIŲ NEFORMALIOJO ŠVIETIMO CENTRAS

IPhO ICHO ioi ioaa iGeo

ESA Contract No. 4000115691/15/NL/NDe

Duomenų bazės

2016

MOKYTOJAI: SPACEOLYMP-Teacher-DB (2016.01.31)

MOKINIAI: SPACEOLYMP-Pupil-DB (2016.02.29)

Pastaba: duomenų bazės bus reguliariai papildomos naujais dalyviais

7 uždavinynai (STEM)

2016 – 3 seminarai

- Uždavinynas - EKA 50: Matematika, Kosmosas, Inovacijos (2016.05.31)
- Uždavinynas - EKA 50: Fizika, Kosmosas, Inovacijos (2016.08.31)
- Uždavinynas - EKA 50: Chemija, Kosmosas, Inovacijos (2016.11.30)

2017 – 4 seminarai

- Uždavinynas - EKA 50: Informatika, Kosmosas, Inovacijos (2017.02.28)
- Uždavinynas - EKA 50: Biologija, Kosmosas, Inovacijos (2017.05.31)
- Uždavinynas - EKA 50: Astronomija, Kosmosas, Inovacijos (2017.08.31)
- Uždavinynas - EKA 50: Geografija, Kosmosas, Inovacijos (2017.11.30)

Specialūs renginiai

2016 | 7 seminarai | 2017

1. Matematika
2. Fizika
3. Chemija
4. Informatika
5. Biologija
6. Astronomija
7. Geografija

Seminaras - rezultatų aptarimas: Vilnius, Kaunas

LIETUVOS INOVACIJŲ CENTRAS
esa

Rezultatai

LIETUVOS MOKINIŲ NEFORMALIOJO ŠVIETIMO CENTRAS

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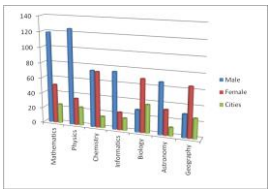
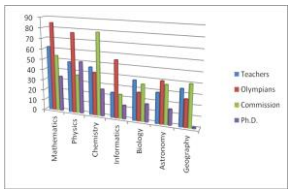
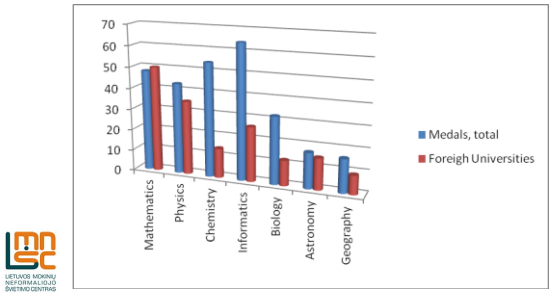






Duomenų bazėje **SPACEOLYMP-Teacher-DB** yra 872 asmenų pavardės

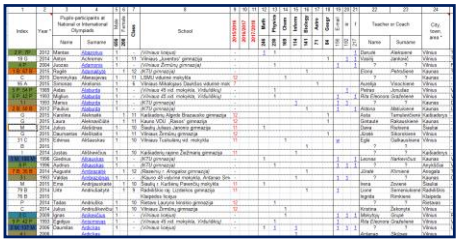
98 asmenys (29 vyrai, 69 moterys) yra susiję su nacionalinėmis ir tarptautinėmis Biologijos olimpiadomis (atitinkamai NBO ir TBO). Tai 38 mokytojai (jų mokiniai tapo NBO prizininkais 2014-2015 m.), 27 TBO dalyviai, 35 NBO vertinimo komisijos nariai. Minėtų asmenų tarpe yra 17 mokslo daktarų.

27 TBO dalyviai laimėjo 32 medalius (1 aukso, 11 sidabro, 20 bronzos).

98 asmenys atstovauja 17 Lietuvos miestų ir miestelių. 38 mokytojų tarpe 6 yra iš Vilniaus, 4 - Kauno, 1 - Klaipėdos, 5 - Šiaulių, 3 - Panevėžio.

12 olimpiečių-biologų baigė (arba studijuoja) mokslus užsienio universitetuose (Kembridžas, Oksfordas ir kt.).

Duomenų bazėje **SPACEOLYMP-Pupil-DB** yra 864 mokinių pavardės



NBO Lietuvoje vyksta nuo 1967, TBO pradėjo dalyvauti 2007 metais.
113 mokinių (55 vyrai, 58 moterys) dalyvavo NBO (2014 ir 2015) ir TBO.
Pastaba: **28 mokiniai dalyvavo ir kitų dalykų NO**.

NBO (2014-2015) dalyviai laimėjo 39 medalius (10 aukso, 10 sidabro, 19 bronzos), 17 yra apdovanoti pagyrimo raštais.

113 mokinių atstovauja 35 Lietuvos miestams ir miesteliams, iš Vilniaus - 21, Kauno - 20, Klaipėdos - 7, Šiaulių - 9, Panevėžio - 4 ir t.t.

Mokytojai

Mokiniai

ESA Contract No. 4000115691/15/NL/NDe

Biologijos uždavinynas

LIETUVOS INOVACIJŲ CENTRAS

EKA kontraktas Nr. 4000115691/15/NL/NDe
17 puslapis

EKA 50: Biologija, Kosmosas, Inovacijos
(Uždavinynas, 50 klausimų su atsakymais)

Biologija ir Kosmosas
http://www.nasa.gov/hrp/education
http://www.nasa.gov/hrp/bodyinspace
https://www.nasa.gov/…/research/space-synthetic-biology-home

Socialinė grupė „SPACEOLYMP"

Bus skelbiama informacija apie projekto rezultatus, pateikiami praktiniai patarimai, apibendrinimai ir pan.

Portalas - www.inovacijos.lt

LITHUANIAN INNOVATION CENTRE

LIETUVOS INOVACIJŲ CENTRAS

Metodika

LIETUVOS MOKINIŲ NEFORMALIOJO ŠVIETIMO CENTRAS

A		LIC - SPACEOLYMP - ESA						D
	Earth, Sun, Moon, Comet, Mars, Asteroide, Planet, Meteorite	B			C		GOOGLE Earth, GOOGLE Moon, GOOGLE Mars, GOOGLE Sky	
		Mathematics	Physics	Chemistry	Innovativeness			
		Informatics	**Biology**	Astronomy	Engineering			
			Geography		Technology transfer			
K	Lithuanians	8 (Q/A)	9 (Q/A)	10 (Q/A)	11 (Q/A)	12 (Q/A)	Historical facts	E
J	Mathematics	Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope	F
	Physics	Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut	
	Chemistry	Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot	
	Informatics	Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket	
	Biology	Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle	
	Astronomy	Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS	
	Geography	Problem 7	Problem 17	Problem 27	Problem 37	Problem 47	Cubesat	
		Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite	
		Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover	
		Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe	
I	Time, Period, Angle, Coordinate, Trajectory, Orbit, Distance, Velocity	H					Temperature, Mass, Gravity, Atmosphere, Frequency, Radiation, Wave, Magnetism	G
		NASA, ESA, Roscosmos, JAXA, CNSA, ISRO, CNES, DLR						

ESA Contract No. 4000115691/15/NL/NDe

LIETUVOS INOVACIJŲ CENTRAS

esa

Dalyvavimas projekte

LIETUVOS MOKINIŲ NEFORMALIOJO ŠVIETIMO CENTRAS

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LIETUVOS INOVACIJŲ CENTRAS

esa

2014 m. Europos Kosmoso agentūros

„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje

Nr. AO/1-8108/14/NL/NDe“

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto trukmė: **2 metai**

SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

Aš, žemiau pasirašęs sutinku dalyvauti projekto „**Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“** veikloje, ir *pagal galimybes*:

- teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
- teiksiu projekto vykdytojui (el. paštu) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Giedrė Kmitienė, Rimutė Barkuvienė, Nadiežda Pašuto, Dalius Dapkus, Gintaras Riauba, Rūta Leinartaitė, Asta Daulenskienė, Alma Čekauskienė, Irina Barabanova, Aldona Matiukienė, Audrius Petrašiūnas, Raimondas Šiukšta, Paulius L. Tamošiūnas, Vida Zubienė, Ingrida Rimkienė, Julius Juodakis, Irmantas Mogila, Antanas Kontautas, Eugenija Janina Žemgulienė, Irena Ūsienė, Kęstutis Kaulius.

IPhO ICHO ioi ioaa iGeo

LIETUVOS INOVACIJŲ CENTRAS

esa

Sėkmės olimpiadose!

s.lapienis@lic.lt
8 5 2356116; 8 698 83021
www.lic.lt

LIETUVOS MOKINIŲ NEFORMALIOJO ŠVIETIMO CENTRAS

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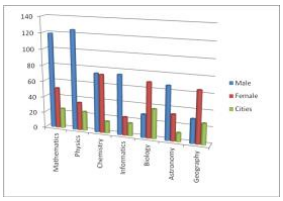
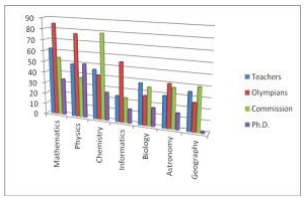
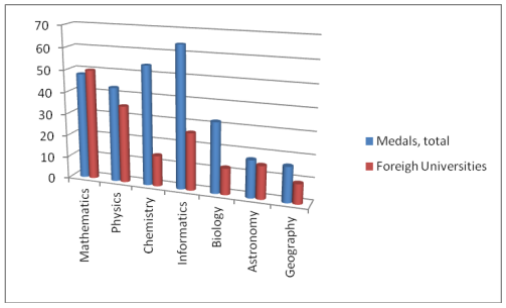
Slides exceptionally for BoP in Chemistry







Duomenų bazėje **SPACEOLYMP-Teacher-DB** yra 872 asmenų pavardės

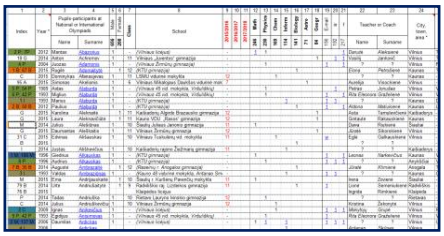
144 asmenys (71 vyras, 73 moterys) yra susiję su nacionalinėmis ir tarptautinėmis Chemijos olimpiadomis (atitinkamai NChO ir TChO). Tai 46 mokytojai (jų mokiniai tapo NBO prizininkais 2014-2015 m.), 41 TChO dalyvis, 79 NChO vertinimo komisijos nariai. Minėtų asmenų tarpe yra 26 mokslo daktarai.

41 TChO dalyvis laimėjo 54 medalius (7 aukso, 18 sidabro, 29 bronzos).

144 asmenys atstovauja 15 Lietuvos miestų ir miestelių. 46 mokytojų tarpe 18 yra iš Vilniaus, 5 - Kauno, 3 - Klaipėdos, 4 - Šiaulių, 5 - Panevėžio.

33 olimpiečiai-chemikai baigė (arba studijuoja) mokslus užsienio universitetuose (Kembridžas, Oksfordas ir kt.).

Duomenų bazėje **SPACEOLYMP-Pupil-DB** yra 864 mokinių pavardės



NChO Lietuvoje vyksta nuo 1962, TChO pradėjo dalyvauti 1992 metais.
137 mokiniai (102 vyrai, 35 moterys) dalyvavo NChO (2014 ir 2015) ir TChO.
Pastaba: **32 mokiniai dalyvavo ir kitų dalykų NO**.

NChO (2014-2015) dalyviai laimėjo 42 medalius (9 aukso, 15 sidabro, 18 bronzos), 28 yra apdovanoti pagyrimo raštais.

137 mokiniai atstovauja 22 Lietuvos miestams ir miesteliams, iš Vilniaus - 41, Kauno - 32, Klaipėdos - 16, Šiaulių - 7, Panevėžio - 8 ir t.t.

ESA Contract No. 4000115691/15/NL/NDe

Chemijos uždavinynas

LIETUVOS INOVACIJŲ CENTRAS

EKA kontraktas Nr. 4000115691/15/NL/NDe
17 puslapis

EKA 50: Chemija, Kosmosas, Inovacijos

(Uždavinynas, 50 klausimų su atsakymais)

Chemija ir Kosmosas

http://science.gsfc.nasa.gov/solarsystem/astrochemistry/ -
http://www.astrobio.net/topic/deep-space/cosmic-evolution/the-chemistry-of-space/
http://pubs.acs.org/doi/abs/10.1021/ed064p228

A		LIC - SPACEOLYMP - ESA						D
	Earth, Sun, Moon, Comet, Mars, Asteroide, Planet, Meteorite	B			C		GOOGLE Earth, GOOGLE Moon, GOOGLE Mars, GOOGLE Sky	
		Mathematics, Informatics	Physics, Biology, Geography	Chemistry, Astronomy	Innovativeness, Engineering, Technology transfer			
K	Lithuanians	8 (Q/A)	9 (Q/A)	10 (Q/A)	11 (Q/A)	12 (Q/A)	Historical facts	E
J	Mathematics, Physics, Chemistry, Informatics, Biology, Astronomy, Geography	Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope	F
		Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut	
		Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot	
		Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket	
		Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle	
		Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS	
		Problem 7	Problem 17	Problem 27	Problem 37	Problem 47	Cubesat	
		Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite	
		Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover	
		Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe	
I	Time, Period, Angle, Coordinate, Trajectory, Orbit, Distance, Velocity	NASA, ESA, Roscosmos, JAXA, CNSA, ISRO, CNES, DLR					Temperature, Mass, Gravity, Atmosphere, Frequency, Radiation, Wave, Magnetism	G
		H						

LIETUVOS INOVACIJŲ CENTRAS

2014 m. Europos Kosmoso agentūros

„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje

Nr. AO/1-8108/14/NL/NDe“

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto trukmė: **2 metai**

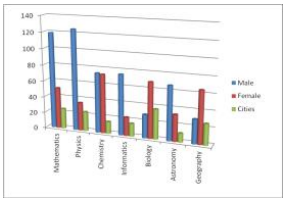
SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

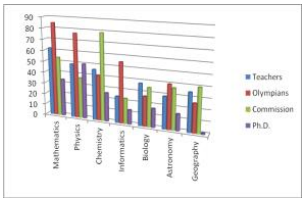
Aš, žemiau pasirašęs sutinku dalyvauti projekto „**Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“** veikloje, ir *pagal galimybes*:

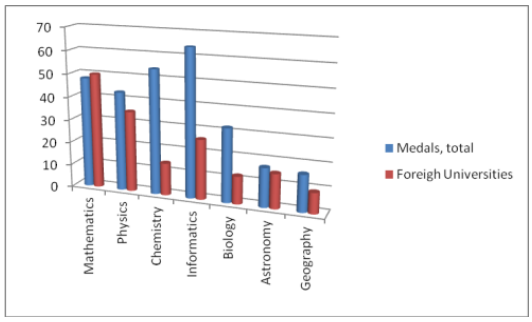
- teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
- teiksiu projekto vykdytojui (el. paštu) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Audronė Gefenienė, Vladas Gefenas, Rūta Leinartaitė, Rima Grabauskienė, Vytenis Gustainis, Daiva Jemeljanovienė, Rasa Lažinskienė, Janė Liutkienė, Birutė Maciulevičienė, Rimantas Raudonis, Virginija Savickaitė, Rasa Žemaitaitienė, Henrikas Liolys, Raimondas Giraitis, Laima Bajorūnienė, Ramūnas Skaudžius, Eugenija Teišerskienė, Ilona Nutautienė, Renata Česūnienė, Vilius Mincevičius.

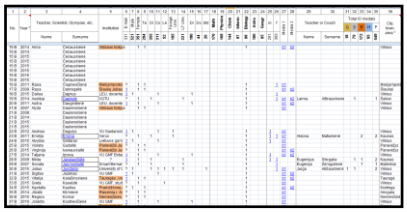
Slides exceptionally for BoP in Mathematics







Duomenų bazėje **SPACEOLYMP-Teacher-DB** yra 872 asmenų pavardės



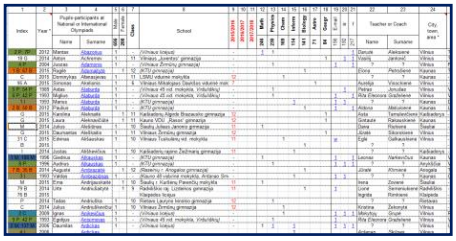
170 asmenų (119 vyrų, 51 moteris) yra susiję su nacionalinėmis ir tarptautinėmis Matematikos olimpiadomis (atitinkamai NMO ir TMO). Tai 62 mokytojai (jų mokiniai tapo NMO prizininkais 2014-2015 m.), 85 TMO dalyvis, 54 NMO vertinimo komisijos nariai. Minėtų asmenų tarpe yra 34 mokslo daktarai.

85 TMO dalyvis laimėjo 48 medalius (1 aukso, 8 sidabro, 39 bronzos).

170 asmenų atstovauja 25 Lietuvos miestų ir miestelių. 62 mokytojų tarpe 20 yra iš Vilniaus, 8 - Kauno, 2 - Klaipėdos, 4 - Šiaulių, 4 - Panevėžio.

50 olimpiečių-matematikų baigė (arba studijuoja) mokslus užsienio universitetuose (Kembridžas, Oksfordas ir kt.).

Duomenų bazėje **SPACEOLYMP-Pupil-DB** yra 864 mokinių pavardės



NMO Lietuvoje vyksta nuo 1951, TMO pradėjo dalyvauti 1992 metais.
222 mokiniai (172 vyrai, 55 moterys) dalyvavo NMO (2014 ir 2015) ir TMO.
Pastaba: **24 mokiniai dalyvavo ir kitų dalykų NO**.

NMO (2014-2015) dalyviai laimėjo 55 medalius (12 aukso, 16 sidabro, 27 bronzos), 43 yra apdovanoti pagyrimo raštais.

222 mokiniai atstovauja 49 Lietuvos miestams ir miesteliams, iš Vilniaus - 89, Kauno - 39, Klaipėdos - 3, Šiaulių - 8, Panevėžio - 13 ir t.t.

ESA Contract No. 4000115691/15/NL/NDe

Matematikos uždavinynas

LIETUVOS INOVACIJŲ CENTRAS

EKA kontraktas Nr. 4000115691/15/NL/NDe
17 puslapis

EKA 50: Matematika, Kosmosas, Inovacijos

(Uždavinynas, 50 klausimų su atsakymais)

Matematika ir Kosmosas
http://spacemath.gsfc.nasa.gov/
http://www.nasa.gov/hrp/communications/estm-project

A			LIC - SPACEOLYMP - ESA					D
	Earth	Sun	B			C		GOOGLE Earth
	Moon	Comet	Mathematics	Physics	Chemistry	Innovativeness		GOOGLE Moon
	Mars	Asteroide	Informatics	Biology	Astronomy	Engineering		GOOGLE Mars
	Planet	Meteorite		Geography		Technology transfer		GOOGLE Sky
K	Lithuanians		8 (Q/A)	9 (Q/A)	10 (Q/A)	11 (Q/A)	12 (Q/A)	Historical facts E
J			Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope
	Mathematics		Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut
	Physics		Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot
	Chemistry		Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket
	Informatics		Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle
	Biology		Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS
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	Geography		Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite
			Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover
			Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe F
I	Time		NASA					Temperature
	Period		ESA					Mass
	Angle		Roscosmos					Gravity
	Coordinate		JAXA					Atmosphere
	Trajectory		CNSA					Frequency
	Orbit		ISRO					Radiation
	Distance		CNES					Wave
	Velocity		DLR					Magnetism
			H					G

LIETUVOS INOVACIJŲ CENTRAS

2014 m. Europos Kosmoso agentūros

„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje

Nr. AO/1-8108/14/NL/NDe“

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto trukmė: **2 metai**

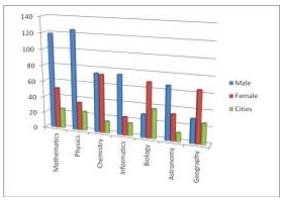
SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

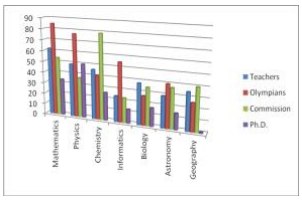
Aš, žemiau pasirašęs sutinku dalyvauti projekto „**Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“** veikloje, ir *pagal galimybes*:

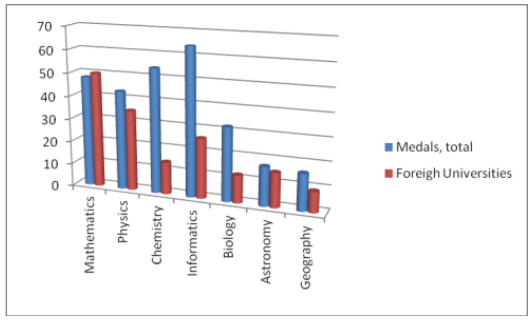
- teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
- teiksiu projekto vykdytojui (el. paštu) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Romualdas Kašuba (M), Aivaras Novikas (M), Edmundas Mazėtis (M), Liliana Rukienė* (F), Zina Šiaulienė (F), Povilas Tvarijonas (M), Paulius Šarka (M), Natalja Sinicyna (F), Vytautas Narmontas (M), Leonas Narkevičius (M), Petrė Valda Grebeničenkaitė (F), Artūras Dubickas (M), Aleksandr Choliavkin (M), Benas Budvytis (M), Alvydas Beinakaraitis (M)

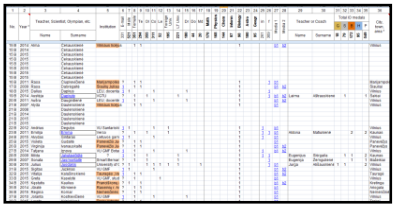
Slides exceptionally for BoP in Physics







Duomenų bazėje **SPACEOLYMP-Teacher-DB** yra 872 asmenų pavardės



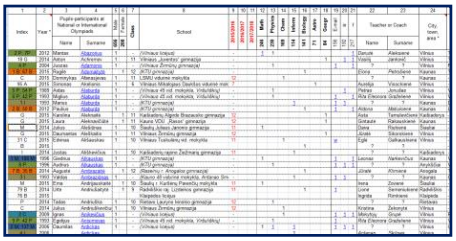
160 asmenų (125 vyrų, 35 moteris) yra susiję su nacionalinėmis ir tarptautinėmis Fizikos olimpiadomis (atitinkamai NMO ir TMO). Tai 49 mokytojai (jų mokiniai tapo NMO prizininkais 2014-2015 m.), 77 TMO dalyviai, 37 NMO vertinimo komisijos nariai. Minėtų asmenų tarpe yra 50 mokslo daktarų.

77 TMO dalyvis laimėjo 43 medalius (1 aukso, 10 sidabro, 32 bronzos).

160 asmenų atstovauja 24 Lietuvos miestus ir miestelius. 49 mokytojų tarpe 12 yra iš Vilniaus, 7 - Kauno, 5 - Klaipėdos, 5 - Šiaulių, 4 - Panevėžio.

42 olimpiečiai-fizikai baigė (arba studijuoja) mokslus užsienio universitetuose (Kembridžas, Oksfordas ir kt.).

Duomenų bazėje **SPACEOLYMP-Pupil-DB** yra 864 mokinių pavardės



NMO Lietuvoje vyksta nuo 1952, TMO pradėjo dalyvauti 1992 metais (1989 svečiai). 199 mokiniai (167 vyrai, 32 moterys) dalyvavo NMO (2014 ir 2015) ir TMO.
Pastaba: **12 mokinių dalyvavo ir kitų dalykų NO**.

NMO (2014-2015) dalyviai laimėjo 52 medalius (9 aukso, 15 sidabro, 28 bronzos), 40 yra apdovanoti pagyrimo raštais.

199 mokiniai atstovauja 34 Lietuvos miestams ir miesteliams, iš Vilniaus - 84, Kauno - 22, Klaipėdos - 16, Šiaulių - 9, Panevėžio - 9 ir t.t.

ESA Contract No. 4000115691/15/NL/NDe

Fizikos uždavinynas

LIETUVOS INOVACIJŲ CENTRAS

EKA kontraktas Nr. 4000115691/15/NL/NDe
17 puslapis

EKA 50: Fizika, Kosmosas, Inovacijos
(Uždavinynas, 50 klausimų su atsakymais)

Fizika ir Kosmosas
http://funphysics.jpl.nasa.gov/

A		LIC - SPACEOLYMP - ESA						D
	Earth, Sun, Moon, Comet, Mars, Asteroide, Planet, Meteorite	B			C		GOOGLE Earth, GOOGLE Moon, GOOGLE Mars, GOOGLE Sky	
		Mathematics	**Physics**	Chemistry	Innovativeness			
		Informatics	Biology	Astronomy	Engineering			
			Geography		Technology transfer			
K	**Lithuanians**	**8** (Q/A)	**9** (Q/A)	**10** (Q/A)	**11** (Q/A)	**12** (Q/A)	**Historical facts**	E
J	Mathematics	Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope	F
	Physics	Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut	
	Chemistry	Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot	
	Informatics	Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket	
	Biology	Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle	
	Astronomy	Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS	
	Geography	Problem 7	Problem 17	Problem 27	Problem 37	Problem 47	Cubesat	
		Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite	
		Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover	
		Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe	
I	Time, Period, Angle, Coordinate, Trajectory, Orbit, Distance, Velocity	NASA, ESA, Roscosmos, JAXA, CNSA, ISRO, CNES, DLR					Temperature, Mass, Gravity, Atmosphere, Frequency, Radiation, Wave, Magnetism	G
		H						

LIETUVOS INOVACIJŲ CENTRAS

2014 m. Europos Kosmoso agentūros

„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje

Nr. AO/1-8108/14/NL/NDe“

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto trukmė: **2 metai**

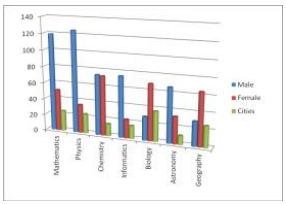
SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

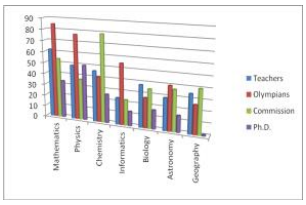
Aš, žemiau pasirašęs sutinku dalyvauti projekto „**Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“** veikloje, ir *pagal galimybes*:

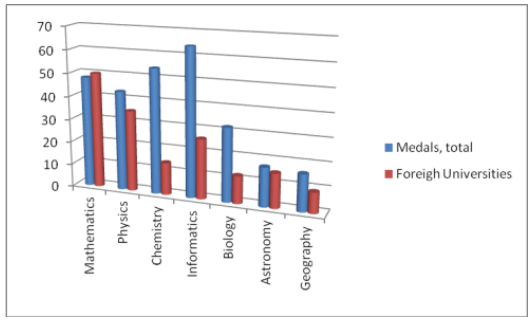
- teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
- teiksiu projekto vykdytojui (el. paštu) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Vytautas Lapeika (M), Roza Miliajeva (F), Rūta Leinartaitė** (F), Danutė Aleksienė (F), Brigita Abakevičienė (F), Žilvinas Norgėla (M), Eugenijus Rudminas (M), Violeta Šlekienė (F), Saulius Žukauskas (M), Marius Žadvydas (M), Romualdas Uža (M), Saulius Pelanskis (M), Ovidijus Kavaliauskas (M), Jolanta Jurevičiūtė (F), Virginija Gineikė (F), Tomas Kivaras (M), Raimundas Sereika (M), Edmundas Kuokštis (M), Pavelas Bodganovičius (M), Elena Kryževičienė (F)

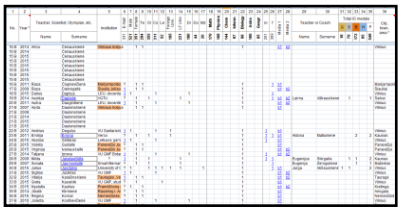
Slides exceptionally for BoP in Informatics







Duomenų bazėje **SPACEOLYMP-Teacher-DB** yra 872 asmenų pavardės



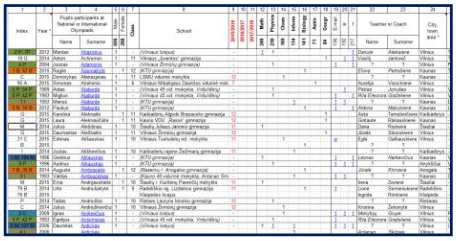
98 asmenų (75 vyrų, 23 moteris) yra susiję su nacionalinėmis ir tarptautinėmis Informatikos olimpiadomis (atitinkamai NMO ir TMO). Tai 24 mokytojai (jų mokiniai tapo NMO prizininkais 2014-2015 m.), 55 TMO dalyviai, 23 NMO vertinimo komisijos nariai. Minėtų asmenų tarpe yra 13 mokslo daktarų.

55 TMO dalyviai laimėjo 64 medalius (2 aukso, 24 sidabro, 38 bronzos).

98 asmenų atstovauja 16 Lietuvos miestų ir miestelių. 24 mokytojų tarpe 8 yra iš Vilniaus, 6 - Kauno, 2 - Klaipėdos, 3 - Šiaulių, 1 - Panevėžio.

30 olimpiečių-finformatikų baigė (arba studijuoja) mokslus užsienio universitetuose (Kembridžas, Oksfordas ir kt.).

Duomenų bazėje **SPACEOLYMP-Pupil-DB** yra 864 mokinių pavardės



NMO Lietuvoje vyksta nuo 1989, TMO pradėjo dalyvauti 1992 metais.
86 mokiniai (84 vyrai, 2 moterys) dalyvavo NMO (2014 ir 2015) ir TMO.
Pastaba: **7 mokiniai dalyvavo ir kitų dalykų NO**.

NMO (2014-2015) dalyviai laimėjo 36 medalius (11aukso, 13 sidabro, 12 bronzos), 7 yra apdovanoti pagyrimo raštais.

86 mokiniai atstovauja 20 Lietuvos miestų ir miestelių, iš Vilniaus - 39, Kauno - 16, Klaipėdos - 5, Šiaulių - 2, Panevėžio - 9 ir t.t.

ESA Contract No. 4000115691/15/NL/NDe

Informatikos uždavinynas

LIETUVOS INOVACIJŲ CENTRAS

EKA kontraktas Nr. 4000115691/15/NL/NDe
17 puslapis

EKA 50: Informatika, Kosmosas, Inovacijos

(Uždavinynas, 50 klausimų su atsakymais)

Informatika ir Kosmosas

http://hpde.gsfc.nasa.gov/Borne_Informatics.ppt
http://serc.carleton.edu/usingdata/index.html
http://d32ogoqmya1dw8.cloudfront.net/files/usingdata/UsingData.pdf
http://www.dlese.org/library/index.jsp

A			LIC - SPACEOLYMP - ESA					D
	Earth	Sun	B			C	GOOGLE Earth	
	Moon	Comet	Mathematics	Physics	Chemistry	Innovativeness	GOOGLE Moon	
	Mars	Asteroide	Informatics	Biology	Astronomy	Engineering	GOOGLE Mars	
	Planet	Meteorite		Geography		Technology transfer	GOOGLE Sky	
K	Lithuanians		8 (Q/A)	9 (Q/A)	10 (Q/A)	11 (Q/A)	12 (Q/A)	Historical facts	E
			Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope	
	Mathematics		Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut	
	Physics		Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot	
	Chemistry		Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket	
J	Informatics		Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle	F
	Biology		Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS	
	Astronomy		Problem 7	Problem 17	Problem 27	Problem 37	Problem 47	Cubesat	
	Geography		Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite	
			Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover	
			Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe	
	Time		NASA					Temperature	
	Period		ESA					Mass	
	Angle		Roscosmos					Gravity	
	Coordinate		JAXA					Atmosphere	
	Trajectory		CNSA					Frequency	
	Orbit		ISRO					Radiation	
	Distance		CNES					Wave	
	Velocity		DLR					Magnetism	
I			H						G

LIETUVOS INOVACIJŲ CENTRAS

2014 m. Europos Kosmoso agentūros

„Pirmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje

Nr. AO/1-8108/14/NL/NDe“

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto trukmė: **2 metai**

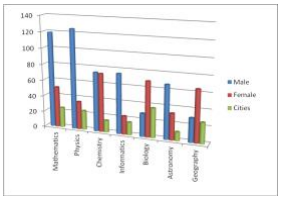
SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

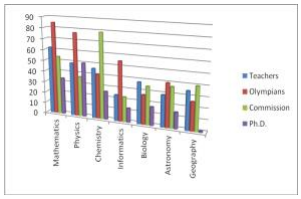
Aš, žemiau pasirašęs sutinku dalyvauti projekto „**Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“** veikloje, ir *pagal galimybes*:

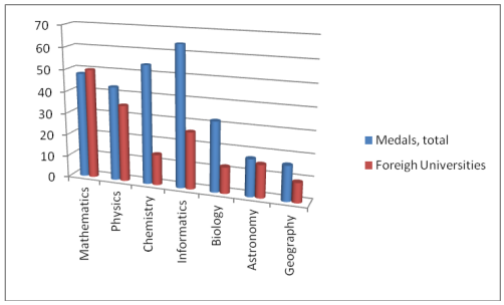
- teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
- teiksiu projekto vykdytojui (el. paštu) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Valentina Dagienė (F), Jūratė Skūpienė (F), Renata Burbaitė (F), Giedrė Kvizikevičienė (F), Gediminas Gricius (M), Jurgis Pralgauskis (M), Antanas Budrūnas (M), Rasa Alaburdienė (F), Liliana Rukienė* (F), Bronius Skūpas (M), Vaidilutė Žukauskienė (F), Danguolė Zigmantaitė (F), Kristina Serapinaitė (F), Vytautas Gruslys (M), Irina Čibiraitė (F)

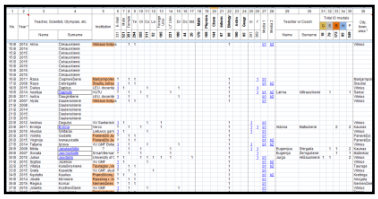
Slides exceptionally for BoP in Astronomy







Duomenų bazėje **SPACEOLYMP-Teacher-DB** yra 872 asmenų pavardės



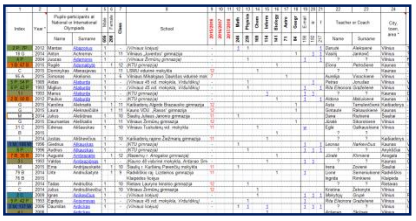
100 asmenų (67 vyrų, 33 moteris) yra susiję su nacionalinėmis ir tarptautinėmis Matematikos olimpiadomis (atitinkamai NMO ir TMO). Tai 29 mokytojai (jų mokiniai tapo NMO prizininkais 2014-2015 m.), 40 TMO dalyvių, 37 NMO vertinimo komisijos nariai. Minėtų asmenų tarpe yra 15 mokslo daktarų.

40 TMO dalyvių laimėjo 17 medalių (3 aukso, 5 sidabro, 9 bronzos).

100 asmenų atstovauja 11 Lietuvos miestų ir miestelių. 29 mokytojų tarpe 12 yra iš Vilniaus, 6 - Kauno, 1 - Klaipėdos, 2 - Šiaulių, ? - Panevėžio.

18 olimpiečių-astronomų baigė (arba studijuoja) mokslus užsienio universitetuose (Kembridžas, Oksfordas ir kt.).

Duomenų bazėje **SPACEOLYMP-Pupil-DB** yra 864 mokinių pavardės



NMO Lietuvoje vyksta nuo 1988, TMO pradėjo dalyvauti 1992 metais.
77 mokiniai (57 vyrai, 20 moterų) dalyvavo NMO (2014 ir 2015) ir TMO.
Pastaba: **11 mokinių dalyvavo ir kitų dalykų NO**.

NMO (2014-2015) dalyviai laimėjo 26 medalius (3 aukso, 9 sidabro, 14 bronzos), 2 yra apdovanoti pagyrimo raštais.

77 mokiniai atstovauja 30 Lietuvos miestams ir miesteliams, iš Vilniaus - 14, Kauno - 13, Klaipėdos - 6, Šiaulių - 4, Panevėžio - 3 ir t.t.

ESA Contract No. 4000115691/15/NL/NDe

Astronomijos uždavinynas

LIETUVOS INOVACIJŲ CENTRAS

EKA kontraktas Nr. 4000115691/15/NL/NDe
17 puslapis

EKA 50: Astronomija, Kosmosas, Inovacijos

(Uždavinynas, 50 klausimų su atsakymais)

Astronomija ir Kosmosas

https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Space.Based.Astronomy.html#.VieUP9LhDEY
https://www.nasa.gov/pdf/58277main_Space.Based.Astronomy.pdf
http://www.nasa.gov/audience/forstudents/5-8/index.html

A		LIC - SPACEOLYMP - ESA						D
	Earth, Sun, Moon, Comet, Mars, Asteroide, Planet, Meteorite	B			C		GOOGLE Earth, GOOGLE Moon, GOOGLE Mars, GOOGLE Sky	
		Mathematics	Physics	Chemistry	Innovativeness			
		Informatics	Biology	Astronomy	Engineering			
			Geography		Technology transfer			
K	Lithuanians	8 (Q/A)	9 (Q/A)	10 (Q/A)	11 (Q/A)	12 (Q/A)	Historical facts	E
J		Problem 1	Problem 11	Problem 21	Problem 31	Problem 41	Telescope	F
	Mathematics	Problem 2	Problem 12	Problem 22	Problem 32	Problem 42	Astronaut	
	Physics	Problem 3	Problem 13	Problem 23	Problem 33	Problem 43	Robot	
	Chemistry	Problem 4	Problem 14	Problem 24	Problem 34	Problem 44	Rocket	
	Informatics	Problem 5	Problem 15	Problem 25	Problem 35	Problem 45	Shuttle	
	Biology	Problem 6	Problem 16	Problem 26	Problem 36	Problem 46	ISS	
	Astronomy	Problem 7	Problem 17	Problem 27	Problem 37	Problem 47	Cubesat	
	Geography	Problem 8	Problem 18	Problem 28	Problem 38	Problem 48	Satellite	
		Problem 9	Problem 19	Problem 29	Problem 39	Problem 49	Rover	
		Problem 10	Problem 20	Problem 30	Problem 40	Problem 50	Probe	
I	Time, Period, Angle, Coordinate, Trajectory, Orbit, Distance, Velocity	H					Temperature, Mass, Gravity, Atmosphere, Frequency, Radiation, Wave, Magnetism	G
		NASA, ESA, Roscosmos, JAXA, CNSA, ISRO, CNES, DLR						

LIETUVOS INOVACIJŲ CENTRAS

2014 m. Europos Kosmoso agentūros

„.'irmasis kvietimas pagal Bendradarbiaujančios valstybės plano chartiją Lietuvoje

Nr. AO/1-8108/14/NL/NDe“

Projekto kodas Nr.: **4000115691/15/NL/NDe**
Projekto vykdytojo pavadinimas: **Lietuvos inovacijų centras**
Projekto pavadinimas: **Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“**
Projekto trukmė: **2 metai**

SUTIKIMAS DALYVAUTI PROJEKTO VEIKLOJE

Aš, žemiau pasirašęs sutinku dalyvauti projekto „**Nacionalinių ir tarptautinių mokslo olimpiadų dalyvių motyvacijos kosmoso tematika didinimas „SPACEOLYMP“** veikloje, ir *pagal galimybes*:

- teiksiu spręsti (testuoti, treniruotis) projekto „SPACEOLYMP“ metu sudaryto uždavinyno užduotis mano dėstomo dalyko mokiniams, dalyvaujantiems mokyklos, o taip pat regioninėse, nacionalinėse ir tarptautinėse mokslo olimpiadose;
- teiksiu projekto vykdytojui (el. paštu) pastabas, pasiūlymus, rekomendacijas, mokinių atsiliepimus ir jų pastabas apie projekto metu sudarytą mano dėstomo dalyko uždavinyną ir užduotis.

Romualda Lazauskaitė (F), Aurelija Visockienė (F), Asta Markauskienė (F), Rita Morkaitienė (F), Ramūnas Naujokaitis (M), Gitana Viganauskienė (F), Marius Žadvydas (M), Saulius Lovčikas (M), Danutė Aleksienė (F), Saulius Raudeliūnas (M), Rigonda Skorulskienė (F), Virginijus Tumavičius (M), Pavel Stankevič (M), Genovaitė Liepinia (F), Reda Krašauskienė (F), Karolis Markauskas (M), Antanas Burkšaitis (M), Irena Jančionytė (F), Vacys Jankus (M), Angelė Borodinienė (F).

Annex L

Part 1 – Annex L-1, Prehistory, 1569-1918, 17 pages, http://online.fliphtml5.com/tfgr/nsia/

Part 2 – Annex L-2, Independence period, 1918-1940, 20 pages, http://online.fliphtml5.com/tfgr/nsia

Part 3 – Annex L-3, Soviet period, 1940-1990, 9 pages, http://online.fliphtml5.com/tfgr/jxhy

Part 4 – Annex L-4, USA, XIX-XXI century, 12 pages, http://online.fliphtml5.com/tfgr/miki

Part 5 – Annex L-5, History today (> 1990.03.11), 23 pages, http://online.fliphtml5.com/tfgr/hgow

Annex Questionnaire

Physics

KLAUSIMYNAS FIZIKOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Fizikos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Fizikos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje fizikos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

Chemistry

KLAUSIMYNAS CHEMIJOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Chemijos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Chemijos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje chemijos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

Informatics

KLAUSIMYNAS INFORMATIKOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Informatikos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Informatikos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje informatikos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

Biology

KLAUSIMYNAS BIOLOGIJOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Biologijos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Biologijos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje biologijos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

Astronomy

KLAUSIMYNAS ASTRONOMIJOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Astronomijos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Astronomijos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje astronomijos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

Geography

KLAUSIMYNAS GEOGRAFIJOS UŽDAVINIŲ SPECIALISTAMS

1) Koks pirmas įspūdis atvertus virtualų Geografijos uždavinyną? (įvertinkite žymėdami „+“ tinkamame langelyje)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
Dizainas					
Struktūra					
Aiškumas					

2) Ar užduotys atitinka Geografijos mokymo programai Lietuvoje? (įvertinkite)

	1 (labai prastai)	2 (prastai)	3 (patenkinamai)	4 (gerai)	5 (labai gerai)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

3) Koks yra užduočių sudėtingumo lygis? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

4) Kaip vertintumėte teiginį „Užduotys bus naudingos kasdieninėje geografijos mokytojų veikloje? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

5) Koks yra užduočių tekstų suprantamumas ir informatyvumas? (įvertinkite)

	1 (labai prastas)	2 (prastas)	3 (patenkinamas)	4 (geras)	5 (labai geras)
8 klasė					
9 klasė					
10 klasė					
11 klasė					
12 klasė					

Jūsų pasiūlymai

Jūsų pastabos

Jūsų atstovaujama pozicija (žymėkite „+“ tinkamame langelyje)

Kontrakto dalyvis	Mokytojas (mokykla, gimnazija)	Mokslininkas (aukštojoje mokykloje)	Buvęs olimpiadininkas	Olimpiadininkas

IŠ ANKSTO DĖKOJAME. SPACEOLYMP KOMANDA.

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