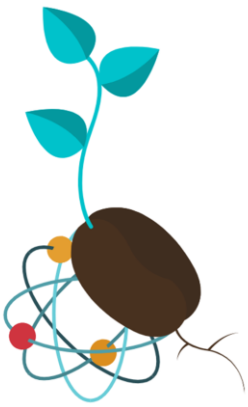
DELIVERABLE 4.1. EVALUATION FRAMEWORK AND EVALUATION PROTOCOL INCLUDING SEEDS ASSESSMENT TOOLS



SEEDS

VERSION V.2

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

VERSION CONTROL SHEET

- **Project summary**

Project acronym	SEEDS
Grant Agreement	101006251
Call	H2020-SwafS-2018-2020 (Science With And For Society)
Topic	SwafS-31-2020
Type of action	RIA (Research and Innovation Action)
Start date	01/01/2021
Duration	24 months
Coordinator	Fundació Institut d'Investigació Sanitària Pere Virgili (IISPV)

- **Document control**

Deliverable	D4.1 Evaluation framework and evaluation protocol including SEEDS assessment tools
Work Package related	WP4
Due date	30th April 2021
Delivery date	10th November 2021
Dissemination level	Public
Lead partner for deliverable	Harokopio University, Athens (HUA)
Authors	Electra Kalogerakou, Alex Karagiannis, Christina Mavrogianni, Yannis Manios
Reviewers	All partners
Approved by	All partners
Version	V.2.

- **Document revision history**

Revision	Issue date	Author	Comments
D4.1 V.0	15.10.21	Kalogerakou, E Karagiannis, A Mavrogianni, C Manios, Y	First draft
D4.1 V.0	22.10.21	All partners	Revision
D4.1 V.1	27.10.21	Kalogerakou, E Karagiannis, A Mavrogianni, C Manios, Y	Second draft
D4.1 V.1	28.10.21	All partners	Revision
D4.1 V.2	29.10.21	Kalogerakou, E Karagiannis, A Mavrogianni, C Manios, Y	Third draft
D4.1 V.2	10.10.21	All partners	Final revision

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

TABLE OF CONTENTS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

DISCLAIMER

This publication is the sole responsibility of SEEDS Consortium and reflects only the authors' view. Thus, the European Commission (EC) is not responsible for any use that may be made of the information it contains.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

ABBREVIATIONS

EC	European Commission
EU	European Union
HUA	Harokopio University of Athens
IISPV	Fundació Institut d'Investigació Sanitària Pere Virgili
SEEDS	Science Engagement to Empower Disadvantaged AdoleScents
SES	Socio-economic status
SWAFS	Science With And For Society
WP	Work Package

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

EXECUTIVE SUMMARY

Science Engagement to Empower Disadvantaged AdoleScents (SEEDS) aims at fostering science interest, literacy and STEM (Science, Technology, Engineering and Mathematics) education, by raising the health understanding, also pursuing the empowerment of youth in an extreme citizen science based on the participation of leader' adolescents in all the research process: identifying adolescents barriers and necessities for having a healthy lifestyles, designing a community-based public intervention for adolescents of low-socioeconomic areas and with stakeholders participation, interpretation of the data and dissemination to community.

The current document describes the evaluation framework, protocol and tools, designed to evaluate the impact of the SEEDS intervention towards specific health behaviours and science interest, as part of Work Package (WP) 4. Specifically, the primary outcomes of the intervention are STEM interest, snacking and physical activity of adolescents.

This deliverable consists of the evaluation framework of the SEEDS intervention, the evaluation protocol and the description of the tools that will be used as part of the impact assessment of the intervention for WP4. Furthermore, it includes the questionnaires that will be used for this pre- and post- assessment of primary outcomes in adolescents.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

1. INTRODUCTION

The impact evaluation of the SEEDs intervention is essential, in order to 1) compare the behaviours and attitudes of adolescents before and after the intervention, to evaluate the effectiveness of a citizen science intervention for promoting healthy snack consumption (inside and outside school), physical activity (inside school) in adolescents of deprived areas and 2) assess whether the science interest of adolescence can be increased through a Citizen Science project, where students actively participate into all-phases of the research, from the conceptualization to the dissemination.

The evaluation of the targeted lifestyle behaviours and science interest in adolescents from areas with low socioeconomic status (SES) needs to be based on evidence-based procedures, as well as according to the needs of this subgroup. Therefore, a well-established model, the Theory of Planned Behaviour, was used to take into consideration all aspects of adolescent's determinants of lifestyle behaviours both for the design of the intervention, as well as for the assessment process. Furthermore, focus groups with both adolescents and stakeholders from low SES areas were implemented in all 4 pilot sites (Greece, Spain, the UK, the Netherlands), to gain insights in the barriers and facilitators related to the key behaviours aimed to be address during the Make-a-thon and intervention phase. The summary reports of these focus groups were taken into account as well in the development of the assessment tools.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

2. INTERVENTION AND EVALUATION FRAMEWORK: THE THEORY OF PLANNED BEHAVIOUR

As the Theory of Planned Behavior[1-5] (as demonstrated in figure 1) will be used for the design of the SEEDS intervention, for the impact evaluation of the intervention not only the changes in behaviors addressed in the intervention will be considered, but also the determinants of each of the behaviors, based on the components of this theory, i.e. 1) the attitudes of the participants towards the behavior performed (linked to her/his individual beliefs regarding the perceived outcome by the behavior), 2) the subjective norms (linked to the social environment of the subject) and 3) the perceived control over the behavior conducted (linked to each individual's weighted power of intentional behavior performance).

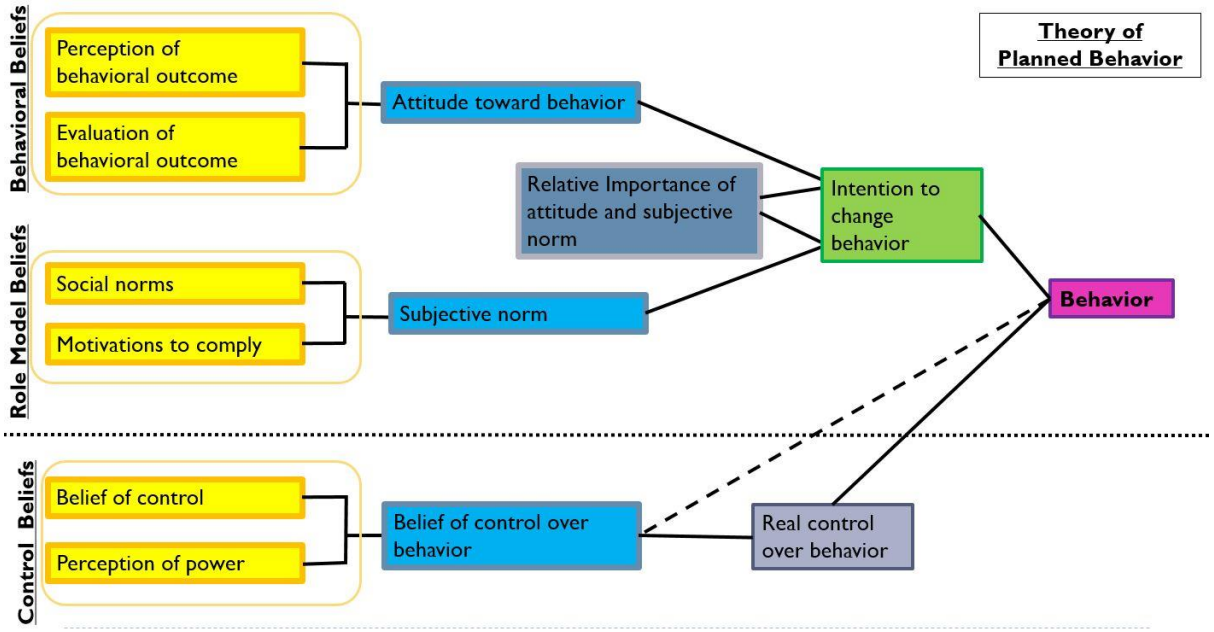


Figure 1. Theory of Planned Behaviour.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

3. EVALUATION PROTOCOL

The primary outcomes of the SEEDS intervention are adolescents' STEM interest, snacking inside and outside school hours, and physical activity inside school. Using the assessment tools presented in the current deliverable, it will be evaluated whether the intervention will have the intended impact on these primary outcomes, but also on selected determinants of these behaviours relevant to attitudes and environmental factors. Furthermore, the evaluation process will provide input on the strategies that can be effective in a citizen science intervention in adolescents living in low SES areas.

3.1. Timing of the evaluation of the SEEDs intervention

Questionnaires will be completed by the adolescents in both intervention and control groups at two time-points:

1) at baseline (pre-intervention evaluation): before the conduction of Makeathons and any involvement of the adolescents in the intervention phase and

2) at follow-up (post-intervention evaluation): after the end of the intervention, in order to assess the impact of the intervention and thus to detect any possible changes in the behaviours, attitudes and STEM interest of adolescents.

3.2. Location and setting

Questionnaires will be completed either online or supplied to participants in a hard-copy version and will be circulated at school settings. Questionnaires will be filled only from students that have provided the consent form signed, both from themselves and from their parents/caregivers. Responsible for data collection will be the researchers. The participants will be requested to complete the questionnaires either during school hours (in consultation with the teachers) or at any convenient time for them, preferably at home, and return the completed questionnaires within a period of two days.

3.3. Storage and handling of the collected data

The completed questionnaires after their collection will be stored in a secure place in each research centre and the information derived should be confidential, pseudonymised and only be used for research purposes. To ensure the anonymisation of the questionnaires data, each participant will be given a unique code, so that no member of the research team could link the collected data with a person, only with their code.

Please find below how the participants' IDs is proposed to be generated:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

Children's code: 7 digits

Child's ID:							

This table will remind you the digits needed for child's coding

- **Country (1 digit):** Spain-> 1, Greece-> 2, UK-> 3, Netherlands-> 4
- **Municipality or equivalent unit (1 digit)**: Each country set a unique number for each municipality recruited, e.g., in Greece: municipality of Kallithea-> 1, municipality of Piraeus->2 etc.
- **School (1 digit)**: Each country set a unique number for each school recruited within each municipality, e.g., 1st High School of Kallithea->1, 3rd High school of Kallithea->2 etc.
- **Grade (1 digit)**: Grade 1-> 1, Grade 2->2, Grade 3-> 3 etc. (in Greece we have 3 grades in high school)
- **Class (1 digit):** Each country set a unique number for each class within each school grade, e.g., Grade 1 in the 1st High school of Kallithea has two classes, so Class 1->1, Class 2->2
- **Number of child (2 digits):** Each country set a unique number for each child within each class. After getting the consent forms from adolescents, sort them by municipality- school-grade and class. Then a serial number can be set of each participant

Example

Child's ID:	**2**	**1**	**3**	**2**	**2**	**1**	**5**
2132215	↓	↓	↓	↓	↓	↓	
	Country: Greece	**Municipality:** Kallithea	**School:** 3rd High school of Kallithea	**Grade:** 2nd Grade	**Class:** 2nd Class	**Child:** 15 *(unique number of this child among the other children from the same class that provided signed consent form)*	

- The code of one participant needs to be consistent and predefined for all questionnaires.
- Save the lists of participants' names and codes in a protected place. Each child needs to have the same code at baseline and follow-up.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

4. ASSESSMENT TOOLS

Two questionnaires will be used for the pre (baseline) and post-intervention evaluation of adolescents' behaviours and attitudes:

1) a questionnaire, which was developed for the evaluation of adolescents' behaviours towards snacking, physical activity and sedentary time as well as the determinants of these behaviours, which also includes questions on socio-demographic variables. Furthermore, there are four additional questions as part of the post-intervention questionnaire (to be completed only by the participants in the intervention schools) in order to assess whether the participants were happy and pleased with the intervention process.

2) a STEM questionnaire (using 3 different validated questionnaires) that will assess the science interest of the participants.

These questionnaires are provided in the Annexes (Annex 1 and 2, respectively).

4.1. Sociodemographic and Behaviour questionnaire

Development of this questionnaire was based on previous experiences from similar studies and validated questionnaires[6,7] used in adolescents, while questions for the determinants of each behaviour were added based on the relevant literature and validated questionnaires[8,9], as well as the outputs of the focus groups with adolescents and stakeholders.

Snacking behaviour assessment is based on the "Health Behaviour in School Aged Children" questionnaire[6]. Questions were asked for both at school and at home context. Moreover, some snacking options not included in the validated questionnaire were included, and also the question will be segregated into snacks consumed outside of the school hours, and snacks consumed in school hours. Additional questions were included to assess the key determinants of snacking behaviour.

Physical activity assessment is based on the HBSC questionnaire[6] and Physical Activity Questionnaire (PAQ-c)[7], while questions for the Physical Education classes were derived from the PAQ-c[7]. Questions for the determinants of physical activity and sedentary behaviour in this population were added as well.

Sociodemographic data of adolescents and their family environment will also be collected. Moreover, the socioeconomic level of the families will be obtained through a validated questionnaire, the Family Affluence Scale (FAS)[10].

4.2. STEM questionnaire

In addition, a STEM questionnaire will be used to capture the science interest of the students pre- and post-intervention. This questionnaire is based on three previously published surveys and

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

consists of questions to understand students' interest in (life) science (taken form the STEM interest survey)[11], "scientific capital" (taken from the Science Capital Survey)[12] and interest in STEM career pathways (taken from the Attitude towards STEM questionnaire)[13].The current study is a Citizen Science project, and we are interested in evaluating whether students will be more interested for STEM professions after their involvement in the development and implementation of the intervention.

4.3. Type of questions

Questionnaires are designed to be self-administered. Open-ended questions were limited as much as possible, in order to decrease the burden of its completion from adolescents and obtain high quality data. Likert-type answers are provided in the close-labelled questions, with choices ranging in a 5 to 9-point scale.

4.4. Translation of questionnaires

The initial forms of the questionnaires were developed in English language and commented and approved by all study partners. The questionnaires will be translated in the languages of each intervention site from the local researchers. If there is a validated, translated version of some parts of the questionnaire (e.g., as in the case of HBSC questionnaire), then this will be included in the translated documents.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

5. REFERENCES

1. Blue CL. The predictive capacity of the theory of reasoned action and the theory of planned behavior in exercise research: an integrated literature review. Res Nurs Health. 1995;18(2):105-21.
2. Godin G, Kok G. The theory of planned behavior: a review of its applications to health-related behaviors. Am J Health Promot. 1996;11(2):87-98.
3. Hackman CL, Knowlden AP. Theory of reasoned action and theory of planned behavior-based dietary interventions in adolescents and young adults: a systematic review. Adolesc Health Med Ther. 2014;5:101-14.
4. McDermott MS, Oliver M, Svenson A, Simnadis T, Beck EJ, Coltman T, et al. The theory of planned behaviour and discrete food choices: a systematic review and meta-analysis. Int J Behav Nutr Phys Act. 2015;12:162.
5. Riebl SK, Estabrooks PA, Dunsmore JC, Savla J, Frisard MI, Dietrich AM, et al. A systematic literature review and meta-analysis: The Theory of Planned Behavior's application to understand and predict nutrition-related behaviors in youth. Eat Behav. 2015;18:160-78.
6. Currie C, Griebler R, Inchley J, et al. Health Behaviour in School-aged Children (HBSC) Study Protocol: Background, Methodology and Mandatory Items for the 2009/10 Survey. Edinburgh, 2010.
7. Janz KF, Lutuchy EM, Wenthe P, Levy SM. Measuring activity in children and adolescents using self-report: PAQ-C and PAQ-A. Med Sci Sports Exerc. 2008 Apr;40(4):767-72.
8. Vereecken, C., De Henauw, S., Maes, L., Moreno, L., Manios, Y., Phillipp, K., Plada, M. and De Bourdeaudhuij, I. Reliability and validity of a healthy diet determinants questionnaire for adolescents. Public Health Nutrition, 2009, 12(10), pp.1830-1838.
9. Farias Júnior, J., Lopes, A., Reis, R., Nascimento, J., Borgatto, A. and Hallal, P., 2011. Development and validation of a questionnaire measuring factors associated with physical activity in adolescents. Revista Brasileira de Saúde Materno Infantil, 11(3), pp.301-312.
10. Currie C, Molcho M, Boyce W, Holstein B, Torsheim T, Richter M. Researching health inequalities in adolescents: the development of the Health Behaviour in School-Aged Children (HBSC) family affluence scale. Soc Sci Med. 2008 Mar;66(6):1429-36.
11. Staus, N. L., Lesseig, K., Lamb, R., Falk. J. and Dierking, L. Validation of a Measure of STEM Interest for Adolescents. International Journal of Science and Mathematics Education. 2019;18:279–293. doi: 10.1007/s10763-019-09970-7
12. Archer, L., Dawson, E., DeWitt, J., Seakins, A. and Wong, B. "Science capital": A conceptual, methodological, and empirical argument for extending bourdieusian notions of capital beyond the arts. Journal of Research in Science Teaching. 2015;52:922– 948. doi: 10.1002/tea.21227

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

13. Faber, M., Unfried, A., Wiebe, E. N., Corn, J., Collins and T. L. Student Attitudes toward STEM: The Development of Upper Elementary School and Middle/High School Student Surveys. American Society for Engineering Education. 2013. Paper ID #6955

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

6. ANNEXES

Annex 1. Sociodemographic and behaviours questionnaire

SNACKING AND PHYSICAL ACTIVITY HABITS OF ADOLESCENTS

Country code	Municipality	School number	Grade number	Class number	Child number
☐	☐	☐	☐	☐	☐☐

Today's date

☐☐ ☐☐ ☐☐☐☐

Day Month Year

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

Dear Adolescent,

We are researchers that investigate snacking and physical activity patterns of 1500 adolescents from different countries across Europe, before and after a school intervention. Therefore, we need your help! We would like to ask you to answer this questionnaire.
No one – except for the researchers - will get to know about your answers. So, you don't have to worry that your teacher, parents/caregivers or classmates will see what you answered.
There are no 'right' or 'wrong' answers. Just fill in what applies to you or your situation!
We very much hope that you are willing to fill in the questionnaire. Your participation in the study is voluntary. So, if you don't want to fill in the questionnaire you can tell us.

Thank you in advance for your help!

[Name of the main researcher], [Research center]

How to complete the questionnaire?

• Complete the questionnaire using a blue or black pen (if questionnaire is filled in in paper. However, if the questionnaire is filled online, this is not necessary)
• Place a clear **X** in the answer box.
• Most of the questions can be answered by placing a clear **X** in the answer box. Mark only one box per question. If multiple answers can be given, this will be indicated next to the question. In some questions we ask you to write your own answer.

EXAMPLES:

Does your family own a car, van or truck?

❑1 no

☒2 yes, one

❑3 yes, two or more

If you answer something incorrectly, leave the incorrect **X** and make the correct box completely black.

For example:

Does your family own a car, van or truck?

❑1 no

☒2 yes, one

■3 yes, two or more

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

Socio-demographic Questions

1. How would you describe your gender?

❑1 boy

❑2 girl

❑3 other

2. When were you born?

_ _ / _ _ _ _ (Month/Year)

3. Which is the country where…?

…you were born: ……

…your parents were born: ……

4. Does your family own a car, van or truck?

❑1 no

❑2 yes, one

❑3 yes, two or more

5. Do you have your own bedroom for yourself?

❑1 no

❑2 yes

6. How many computers do your family own (including PCs, Macs, laptops, and tablets, not including game consoles and smartphones)?

❑1 none

❑2 one

❑3 two

❑4 more than two

7. How many times did you and your family travel out of [Please enter your country] for a holiday/vacation last year (without considering the COVID-19 pandemic years)?

❑1 not at all

❑2 once

❑3 twice

❑4 more than twice

8. How many bathrooms (room with a bath/shower or both) are in your home?

❑1 none

❑2 one

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

❑3 two

❑4 more than two

9. Does your family have a dishwasher at home?

❑1 no

❑2 yes

10. All families are different (for example, not everyone lives with both their parents, sometimes people live with just one parent, or they have two homes or live with two families) and we would like to know about yours.

Please answer this question for the home where you live all or most of the time and tick the people who live there. You can mark more than one option.

❑1 mother

❑2 father

❑3 stepmother or father's girlfriend/partner

❑4 stepfather or mother's boyfriend/partner

❑5 I live in a foster home or children's home

❑6 someone or somewhere else (e.g. siblings, grandparents)

Snacking Behaviour

A **snack** is a small portion of food generally eaten between meals. Snacks come in a variety of forms including packaged snack foods and other processed foods, as well as items made from fresh ingredients at home.

The following questions are about your snacking habits. Think about the **last few weeks**. If you don't know or remember exactly what you ate or drank give your best guess. **Please do not leave any question unanswered!** Place a clear **X** in the answer box.

11. A. How many times a week DURING SCHOOL HOURS do you usually eat or drink…?

[Please add local food options]

	never	1 day	2 days	3 days	4 days	everyday
fruit or berries	❑1	❑2	❑3	❑4	❑5	❑6
vegetables	❑1	❑2	❑3	❑4	❑5	❑6
fruit juice or smoothies	❑1	❑2	❑3	❑4	❑5	❑6
sweets or chocolate	❑1	❑2	❑3	❑4	❑5	❑6
cakes or biscuits	❑1	❑2	❑3	❑4	❑5	❑6
crisps or fried potatoes	❑1	❑2	❑3	❑4	❑5	❑6
salted nuts or seeds	❑1	❑2	❑3	❑4	❑5	❑6
unsalted nuts or seeds	❑1	❑2	❑3	❑4	❑5	❑6
pizza	❑1	❑2	❑3	❑4	❑5	❑6
coke or other soft drinks that contain sugar	❑1	❑2	❑3	❑4	❑5	❑6

coke or other soft drinks without sugar	❑1	❑2	❑3	❑4	❑5	❑6
energy drinks (e.g. Red Bull, Lucozade, Monster)	❑1	❑2	❑3	❑4	❑5	❑6
sweetened milk drinks (e.g. milkshake, Breaker, Friski and chocolate milk)	❑1	❑2	❑3	❑4	❑5	❑6
ice-cream	❑1	❑2	❑3	❑4	❑5	❑6
water	❑1	❑2	❑3	❑4	❑5	❑6

12. B. How many times a week BEYOND SCHOOL HOURS do you usually eat or drink…?[Please add local food options]

	never	**less than once a week**	**once a week**	**2-4 days a week**	**5-6 days a week**	**once a day, every day**	**every day, more than once**
fruit or berries	❑1	❑2	❑3	❑4	❑5	❑6	❑7
vegetables	❑1	❑2	❑3	❑4	❑5	❑6	❑7
fruit juice or smoothies	❑1	❑2	❑3	❑4	❑5	❑6	❑7
sweets or chocolate	❑1	❑2	❑3	❑4	❑5	❑6	❑7
cakes or biscuits	❑1	❑2	❑3	❑4	❑5	❑6	❑7
crisps or chips	❑1	❑2	❑3	❑4	❑5	❑6	❑7
salted nuts or seeds	❑1	❑2	❑3	❑4	❑5	❑6	❑7
unsalted nuts or seeds	❑1	❑2	❑3	❑4	❑5	❑6	❑7
pizza	❑1	❑2	❑3	❑4	❑5	❑6	❑7
coke or other soft drinks that contain sugar	❑1	❑2	❑3	❑4	❑5	❑6	❑7
coke or other soft drinks without sugar	❑1	❑2	❑3	❑4	❑5	❑6	❑7
energy drinks (e.g. Red Bull, Lucozade, Monster)	❑1	❑2	❑3	❑4	❑5	❑6	❑7
sweetened milk drinks (e.g. milkshake, Breaker, Friski and chocolate milk)	❑1	❑2	❑3	❑4	❑5	❑6	❑7
ice-cream	❑1	❑2	❑3	❑4	❑5	❑6	❑7
water	❑1	❑2	❑3	❑4	❑5	❑6	❑7

13. Where from do you usually get what you consume at school?

From the school canteen	❑1
From other shops near the school	❑2
From home	❑3

14. This question is about YESTERDAY. Have you eaten snacks yesterday during school time?

❑1 no, I have not eaten snacks yesterday

❑2 yes, 1 snack

❑3 yes, 2 snacks

❑4 yes, 3 snacks

❑5 yes, 4 snacks

❑6 yes, 5 snacks or more

Healthy snacks include those that have significant vitamins, are low in saturated fat and added sugars and have a low sodium content.

EXAMPLES for healthy snacks: [Please add local food options]

Fruits and berries, vegetables (e.g. carrots, cucumber), yogurt, whole grain products (e.g. whole grain bread sticks), unsalted nuts etc.

15. To what extent do you agree with the following sentences?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I affect/have a say in the selection of snacks purchased at home	❑1	❑2	❑3	❑4	❑5
I choose on my own the serving size of the snacks I consume	❑1	❑2	❑3	❑4	❑5
I choose on my own the snacks I will consume at school	❑1	❑2	❑3	❑4	❑5
I think that I should be eating healthier snacks	❑1	❑2	❑3	❑4	❑5
I choose to consume snacks that my friends also eat	❑1	❑2	❑3	❑4	❑5
Eating healthy snacks (like fruits and berries, carrots, cucumber, yogurt, whole grain bread sticks, unsalted nuts etc.) is something I do without even really thinking about.	❑1	❑2	❑3	❑4	❑5
Eating unhealthy snacks (like crisps, chips, pizza, biscuits, pastries and chocolate etc./ Please add local food options) is something I do without even really thinking about.	❑1	❑2	❑3	❑4	❑5
I choose snacks that are advertised on TV or on the internet	❑1	❑2	❑3	❑4	❑5

16. Suppose you want to, how hard is it for you to…?

	A. AT SCHOOL				
	Very hard	**Hard**	**Neutral**	**Not very hard**	**Not hard at all**
… eat healthier snacks (like fruits and berries, carrots, cucumber, yogurt, whole grain bread sticks, unsalted nuts etc. [Please add local food options]	❑1	❑2	❑3	❑4	❑5
	B. AT HOME				
	Very hard	**Hard**	**Neutral**	**Not very hard**	**Not hard at all**
… eat healthier snacks (like fruits and berries, carrots, cucumber, yogurt, whole grain bread sticks, unsalted nuts etc. [Please add local food options]	❑1	❑2	❑3	❑4	❑5

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

17. A barrier or reason why I do not (always) eat healthy snacks (like fruits and berries, carrots, cucumber, yogurt, whole grain bread sticks, unsalted nuts etc./ [Please add local food options]**) is that…**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
…my family members prepare unhealthy snacks…that I am supposed to eat	❑1	❑2	❑3	❑4	❑5
…I have too little time to prepare it	❑1	❑2	❑3	❑4	❑5
…I do not have the possibility to prepare healthy snacks for myself	❑1	❑2	❑3	❑4	❑5
…I cannot find healthy snack options at the school canteen/shops nearby	❑1	❑2	❑3	❑4	❑5
…I do not know very well what is healthy and what is not	❑1	❑2	❑3	❑4	❑5
…it is too expensive	❑1	❑2	❑3	❑4	❑5

Physical Activity and Sedentary Behaviour

Physical activity is any activity that increases your heart rate and makes you breathe somewhat to much harder than normal.

EXAMPLES for physical activity:

running, walking quickly, cycling, dancing, skateboarding, swimming, football, tennis, gymnastics, basketball, volleyball, track & field etc.

Sedentary behaviour is any waking behaviour done while lying, reclining or sitting which is characterised by low energy expenditure.

EXAMPLES for sedentary behaviour:

TV viewing, video game playing, computer use, reading etc.

The following questions are about your physical activity and sedentary behaviour. Think about the **last weeks** (unless stated otherwise). If you don't know or remember exactly what you ate or drank give your best guess. **Please do not leave any question unanswered!** Place a clear **X** in the answer box.

18. Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?

❑1 none
❑2 1 day
❑3 2 days
❑4 3 days
❑5 4 days
❑6 5 days
❑7 6 days
❑8 7 days

19. How often do you usually exercise in your FREE TIME (beyond school hours) so much that you get out of breath or sweat?

❑1 never

❑2 less than once a month

❑3 once a month

❑4 once a week

❑5 2-3 times a week

❑6 4-6 times a week

❑7 every day

20. On a typical day is the main part of your journey to school made by…..?

❑1 walking

❑2 bicycle

❑3 bus, train, underground or boat

❑4 car, motorcycle or moped

❑5 other means

❑6 none, due to COVID-19 pandemic

21. How many hours a day in your FREE TIME (beyond school hours) do you usually spend…?

	None at all	About half an hour /day	About 1 hour /day	About 2 hours /day	About 3 hours /day	About 4 hours /day	About 5 hours /day	About 6 hours /day	About 7 hours or more /day
	A. On WEEKDAYS								
watching TV, videos (including Youtube or similar services), movies/series, and other entertainment on a screen?	❑1	❑2	❑3	❑4	❑5	❑6	❑7	❑8	❑9
playing games on a computer, games console, tablet, smartphone or other electronic device (NOT including moving or fitness games)	❑1	❑2	❑3	❑4	❑5	❑6	❑7	❑8	❑9
using electronic devices such as computers, tablets or smartphones for other purposes, for example, homework, emailing, tweeting, Facebook, chatting, surfing the internet?	❑1	❑2	❑3	❑4	❑5	❑6	❑7	❑8	❑9
	B. **On WEEKEND DAYS**								
watching TV, videos (including Youtube or similar services), movies/series, and	❑1	❑2	❑3	❑4	❑5	❑6	❑7	❑8	❑9

other entertainment on a screen?									
playing games on a computer, games console, tablet, smartphone or other electronic device (NOT including moving or fitness games)	❑1	❑2	❑3	❑4	❑5	❑6	❑7	❑8	❑9
using electronic devices such as computers, tablets or smartphones for other purposes, for example, homework, emailing, tweeting, Facebook, chatting, surfing the internet?	❑1	❑2	❑3	❑4	❑5	❑6	❑7	❑8	❑9

22. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one box per row)

	no	1-2 times	3-4 times	5-6 times	7 times or more
skipping	❑1	❑2	❑3	❑4	❑5
rowing/canoeing	❑1	❑2	❑3	❑4	❑5
in-line skating	❑1	❑2	❑3	❑4	❑5
tag	❑1	❑2	❑3	❑4	❑5
walking for exercise	❑1	❑2	❑3	❑4	❑5
bicycling	❑1	❑2	❑3	❑4	❑5
jogging or running	❑1	❑2	❑3	❑4	❑5
aerobics	❑1	❑2	❑3	❑4	❑5
swimming	❑1	❑2	❑3	❑4	❑5
baseball, softball	❑1	❑2	❑3	❑4	❑5
dance	❑1	❑2	❑3	❑4	❑5
football	❑1	❑2	❑3	❑4	❑5
badminton	❑1	❑2	❑3	❑4	❑5
skateboarding	❑1	❑2	❑3	❑4	❑5
soccer	❑1	❑2	❑3	❑4	❑5
street hockey	❑1	❑2	❑3	❑4	❑5
volleyball	❑1	❑2	❑3	❑4	❑5
floor hockey	❑1	❑2	❑3	❑4	❑5
basketball	❑1	❑2	❑3	❑4	❑5
ice skating	❑1	❑2	❑3	❑4	❑5
cross-country skiing	❑1	❑2	❑3	❑4	❑5
ice hockey-ringette	❑1	❑2	❑3	❑4	❑5
other: ……..	❑1	❑2	❑3	❑4	❑5

23. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)?

❑1 I don't do PE

❑2 hardly ever

❑3 sometimes

❑4 quite often

❑5 always

24. In the last 7 days, what did you do most of the time at recess?

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

❑1 sat down (talking, reading, doing schoolwork)
❑2 stood around or walked around
❑3 ran or played a little bit
❑4 ran around and played quite a bit
❑5 ran and played hard most of the time

25. In the last 7 days, what did you normally do at lunch (besides eating lunch)?

❑1 sat down (talking, reading, doing schoolwork)
❑2 stood around or walked around
❑3 ran or played a little bit
❑4 ran around and played quite a bit
❑5 ran and played hard most of the time

26. In the last 7 days, on how many days right after school, did you do sports, dance, or play games in which you were very active?

❑1 none
❑2 1 time
❑3 2-3 times
❑4 4 times
❑5 5 times

27. In the last 7 days, on how many evenings did you do sports, dance, or play games in which you were very active?

❑1 none
❑2 1 time
❑3 2-3 times
❑4 4-5 times
❑5 6-7 times

28. On the last weekend, how many times did you do sports, dance, or play games in which you were very active?

❑1 none
❑2 1 time
❑3 2-3 times
❑4 4-5 times
❑5 6 or more times

29. Which one of the following describes you best for the last 7 days? Read all five statements before deciding on the one answer that describes you.

❑1 All or most of my free time was spent doing things that involve little physical effort

❑2 I sometimes (1-2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics)

❑3 I often (3-4 times last week) did physical things in my free time

❑4 I quite often (5-6 times last week) did physical things in my free time

❑5 I very often (7 or more times last week) did physical things in my free time

30. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	none	little bit	medium	often	very often
Monday	❑1	❑2	❑3	❑4	❑5
Tuesday	❑1	❑2	❑3	❑4	❑5
Wednesday	❑1	❑2	❑3	❑4	❑5
Thursday	❑1	❑2	❑3	❑4	❑5
Friday	❑1	❑2	❑3	❑4	❑5
Saturday	❑1	❑2	❑3	❑4	❑5
Sunday	❑1	❑2	❑3	❑4	❑5

31. Were you sick last week, or did anything prevent you from doing your normal physical activities?

❑1 Yes

❑2 No

32. If Yes, what prevented you?

……

33. Suppose you want to, how hard is it for you to…?

	A. AT SCHOOL				
	Very hard	**Hard**	**Neutral**	**Not very hard**	**Not hard at all**
…engage more into physical activity	❑1	❑2	❑3	❑4	❑5
…limit your screen time (e.g. smartphone, tablet, video games, TV)	❑1	❑2	❑3	❑4	❑5
	B. AT HOME				
	Very hard	**Hard**	**Neutral**	**Not very hard**	**Not hard at all**
…engage more into physical activity	❑1	❑2	❑3	❑4	❑5
…limit your screen time (e.g. smartphone, tablet, video games, TV)	❑1	❑2	❑3	❑4	❑5

34. A barrier or reason why I do not (always) engage to physical activity during school is…

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
…that there is not enough space to be physically active during school breaks	❑1	❑2	❑3	❑4	❑5
…that I have too little time to engage to physical activity during school breaks	❑1	❑2	❑3	❑4	❑5

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

…that I am not allowed to do sports/play during school breaks	❑1	❑2	❑3	❑4	❑5
…that it is too hot outside during summer months	❑1	❑2	❑3	❑4	❑5
…that I do not want to wear sports clothing at school	❑1	❑2	❑3	❑4	❑5
…that we do not have enough Physical Education (PE) classes	❑1	❑2	❑3	❑4	❑5
…that there are not a lot of options for sports during PE classes	❑1	❑2	❑3	❑4	❑5
…there are no instructions during PE classes	❑1	❑2	❑3	❑4	❑5
…that the surfaces and sports mattresses are not clean enough during PE classes	❑1	❑2	❑3	❑4	❑5
…that I do not like the competition during PE classes	❑1	❑2	❑3	❑4	❑5
…the prolonged sitting time due to long teaching hours	❑1	❑2	❑3	❑4	❑5

Post-intervention questions

(To be answered only by the intervention group)

35. Did you enjoy the program?

A lot	Quite enough	So and so	A little	Not at all
❑	❑	❑	❑	❑

36. Did you actively participate in the program?

Always	Often	Sometimes	Rarely	Never
❑	❑	❑	❑	❑

37. Did the program help you change some behaviors?

A lot	Quite enough	So and so	A little	Not at all
❑	❑	❑	❑	❑

38. Which of the program activities or the changes that occurred in the school would you like to remain in the coming years?

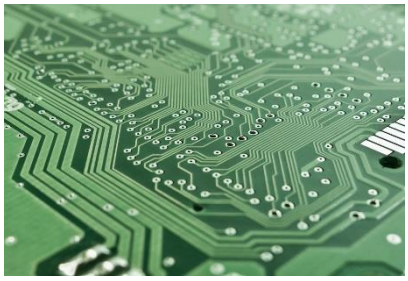
……
……
……
……

Thank you for completing this questionnaire!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

Annex 2. STEM questionnaire

STEM QUESTIONNAIRE



Country code	Municipality	School number	Grade number	Class number	Child number
☐	☐	☐	☐	☐	☐☐

Today's date

☐☐ ☐☐ ☐☐☐☐

Day Month Year

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

Dear Adolescent,

We are researchers that investigate the science interest of 1500 adolescents from different countries across Europe, before and after their involvement in a Citizen-science school-based intervention. Therefore, we need your help! We would like to ask you to answer this questionnaire. It will take approximately one school lesson.

No one – except for the researchers - will get to know about your answers. So, you don't have to worry that your teacher, parents/caregivers or classmates will see what you answered.

There are no 'right' or 'wrong' answers. Just fill in what applies to you or your situation!

We very much hope that you are willing to fill in the questionnaire. Your participation in the study is voluntary. So, if you don't want to fill in the questionnaire you can tell us.

Thank you in advance for your help!

[Name of the main researcher], [Research center]

How to complete the questionnaire?

• Complete the questionnaire using a blue or black pen.
• Place a clear **X** in the answer box.
• Most of the questions can be answered by placing a clear **X** in the answer box. Mark only one box per question. If multiple answers can be given, this will be indicated next to the question. In some questions we ask you to write your own answer.

EXAMPLES:

Being a scientist means?

exploring

How much do you like finding out about…

Score the following items from 1 "strongly disagree" to 5 "strongly agree".

	Strongly disagree	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
What to eat and how to exercise to keep healthy and fit	❑1	❑2	❑3	☒4	❑5

If you answer something incorrectly, leave the incorrect **X** and make the correct box completely black.

For example:

How much do you like finding out about…

Score the following items from 1 "strongly disagree" to 5 "strongly agree".

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
What to eat and how to exercise to keep healthy and fit	❑1	❑2	❑3	☒4	■5

STEM Questions

What does it mean to be a scientist? Please write down the first three words that come up into your mind.

1. Being a scientist means? [3 short open fields]

1._____

2._____

3. _____

Directions for question 2 and 3

There are lists of statements on the following pages. Please mark your answer sheets by marking how you feel about each statement.

As you read the sentence, you will know whether you agree or disagree. Fill in the square box that describes how much you agree or disagree.

Even though some statements are very similar, please answer each statement. This is not timed; work fast, but carefully.

There are no "right" or "wrong" answers! The only correct responses are those that are true *for you*.

Whenever possible, let the things that have happened to you help you make a choice.

Please fill in only one answer per question.

2. How much do you like finding out about…

Score the following items from 1 "strongly disagree" to 5 "strongly agree".

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

What to eat and how to exercise to keep healthy and fit	❑1	❑2	❑3	❑4	❑5
How traits are passed from parents to children	❑1	❑2	❑3	❑4	❑5
How the human body works	❑1	❑2	❑3	❑4	❑5

3. How much do you agree with the following statements?

Score the following items from 1 "strongly disagree" to 5 "strongly agree"

	Strongly disagree	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
4. Careers…					
I would like to have a job that uses science	❑1	❑2	❑3	❑4	❑5
People who are like me, work in science	❑1	❑2	❑3	❑4	❑5
When I grow up, I would like to be a doctor or work in medicine	❑1	❑2	❑3	❑4	❑5
I want to become a scientist	❑1	❑2	❑3	❑4	❑5
Anyone can become a scientist	❑1	❑2	❑3	❑4	❑5
5. Studying science…					
It is important to study science even if you don't want a science job in the future	❑1	❑2	❑3	❑4	❑5
A science qualification can help you get many different types of job	❑1	❑2	❑3	❑4	❑5
6. My understandings of science…					
Other people think of me as a science person	❑1	❑2	❑3	❑4	❑5
I know how to use scientific evidence to make an argument	❑1	❑2	❑3	❑4	❑5
I know quite a lot about science	❑1	❑2	❑3	❑4	❑5
I am confident giving answers in science lessons	❑1	❑2	❑3	❑4	❑5
I don't think I am clever enough to study any of the sciences at A-level	❑1	❑2	❑3	❑4	❑5
7. Science and everyday me…					
Scientists need to be imaginative in their work	❑1	❑2	❑3	❑4	❑5
Science creates new jobs so more people can have work	❑1	❑2	❑3	❑4	❑5
It is useful to know about science in my daily life	❑1	❑2	❑3	❑4	❑5
Getting young people to understand science is important for our society	❑1	❑2	❑3	❑4	❑5

4. Your Future

The last questions are about your future. We present you with descriptions of subject areas that involve math, science, engineering and/or technology, and lists of jobs connected to each subject area. As you read the list below, you will know how interested you are in the subject and the jobs. Fill in the square box that relates to how interested you are.

There are no *"right"* or *"wrong"* answers. The only correct responses are those that *are true for you*.

When using an online questionnaire program, we suggest to use an information button with the list of job examples. Students can open the information if needing supporting information

	Not at all Interested	Not so interested	Interested	Very Interested
Physics: is the study of basic laws governing the motion, energy, structure, and interactions of matter. This can include studying the nature of the universe. *(aviation engineer, alternative energy technician, lab technician, physicist, astronomer)*	❑1	❑2	❑3	❑4
Environmental Work: involves learning about physical and biological processes that govern nature and working to improve the environment. This includes finding and designing solutions to problems like pollution, reusing waste and recycling. *(pollution control analyst, environmental engineer or scientist, erosion control specialist, energy systems engineer and maintenance technician)*	❑1	❑2	❑3	❑4
Biology and Zoology: involves the study of living organisms (such as plants and animals) and the processes of life. This includes working with farm animals and in areas like nutrition and breeding. (*biological technician, biological scientist, plant breeder, crop lab technician, animal scientist, geneticist, zoologist)*	❑1	❑2	❑3	❑4
Veterinary Work: involves the science of preventing or treating disease in animals. *(veterinary assistant, veterinarian, livestock producer, animal caretaker)*	❑1	❑2	❑3	❑4
Mathematics: is the science of numbers and their operations. It involves computation, algorithms and theory used to solve problems and summarize data. *(accountant, applied mathematician, economist, financial analyst, mathematician, statistician, market researcher, stock market analyst)*	❑1	❑2	❑3	❑4
Medicine: involves maintaining health and preventing and treating disease. *(physician's assistant, nurse, doctor, nutritionist, emergency medical technician, physical therapist, dentist)*	❑1	❑2	❑3	❑4
Earth Science: is the study of earth,	❑1	❑2	❑3	❑4

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 101006251

	Not at all Interested	Not so interested	Interested	Very Interested
including the air, land, and ocean. *(geologist, weather forecaster, archaeologist, geoscientist)*				
Computer Science: consists of the development and testing of computer systems, designing new programs and helping others to use computers. *(computer support specialist, computer programmer, computer and network technician, gaming designer, computer software engineer, information technology specialist)*	❑1	❑2	❑3	❑4
Medical Science: involves researching human disease and working to find new solutions to human health problems. *(clinical laboratory technologist, medical scientist, biomedical engineer, epidemiologist, pharmacologist)*	❑1	❑2	❑3	❑4
Chemistry: uses math and experiments to search for new chemicals, and to study the structure of matter and how it behaves. *(chemical technician, chemist, chemical engineer)*	❑1	❑2	❑3	❑4
Energy: involves the study and generation of power, such as heat or electricity. *(electrician, electrical engineer, heating, ventilation, and air conditioning (HVAC) technician, nuclear engineer, systems engineer, alternative energy systems installer or technician)*	❑1	❑2	❑3	❑4
Engineering: involves designing, testing, and manufacturing new products (like machines, bridges, buildings, and electronics) through the use of math, science, and computers. *(civil, industrial, agricultural, or mechanical engineers, welder, automechanic, engineering technician, construction manager)*	❑1	❑2	❑3	❑4

Thank you for completing this questionnaire!