Material Development

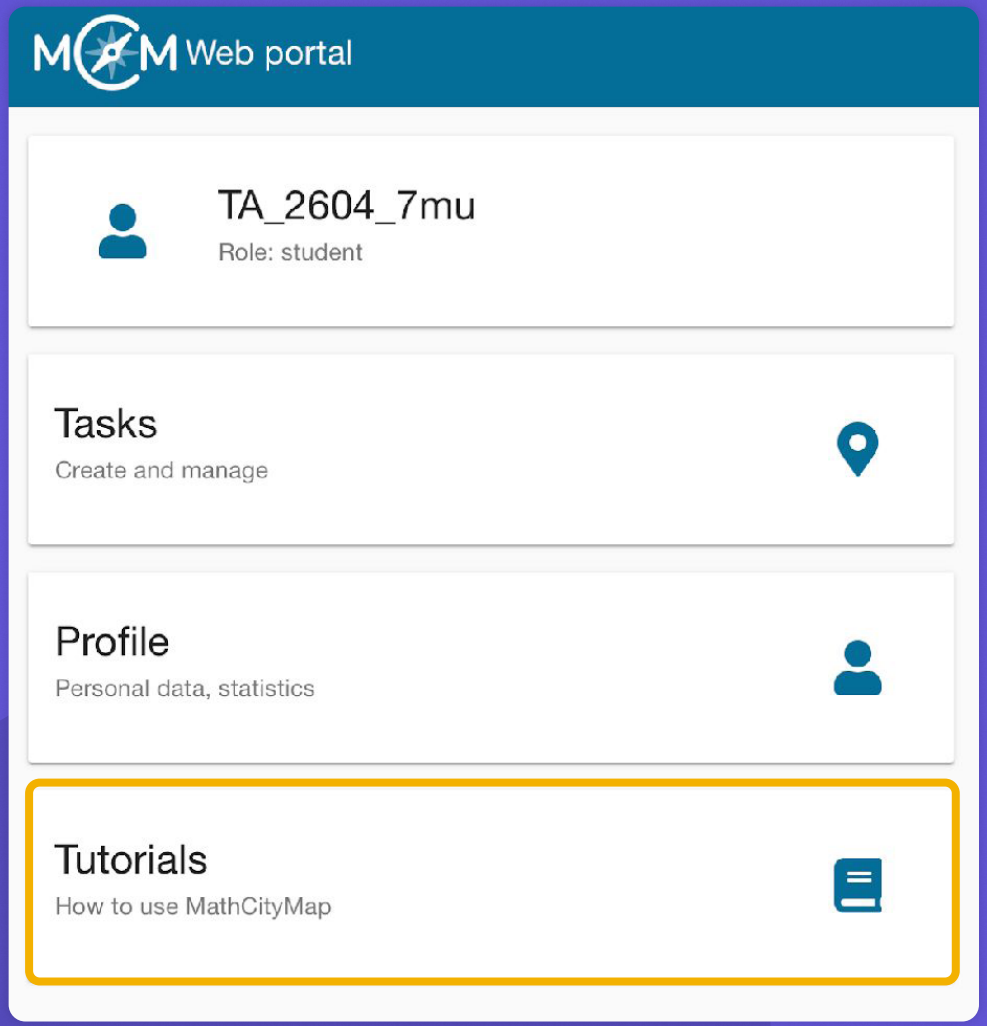
matrix

Co-funded by
the European Union

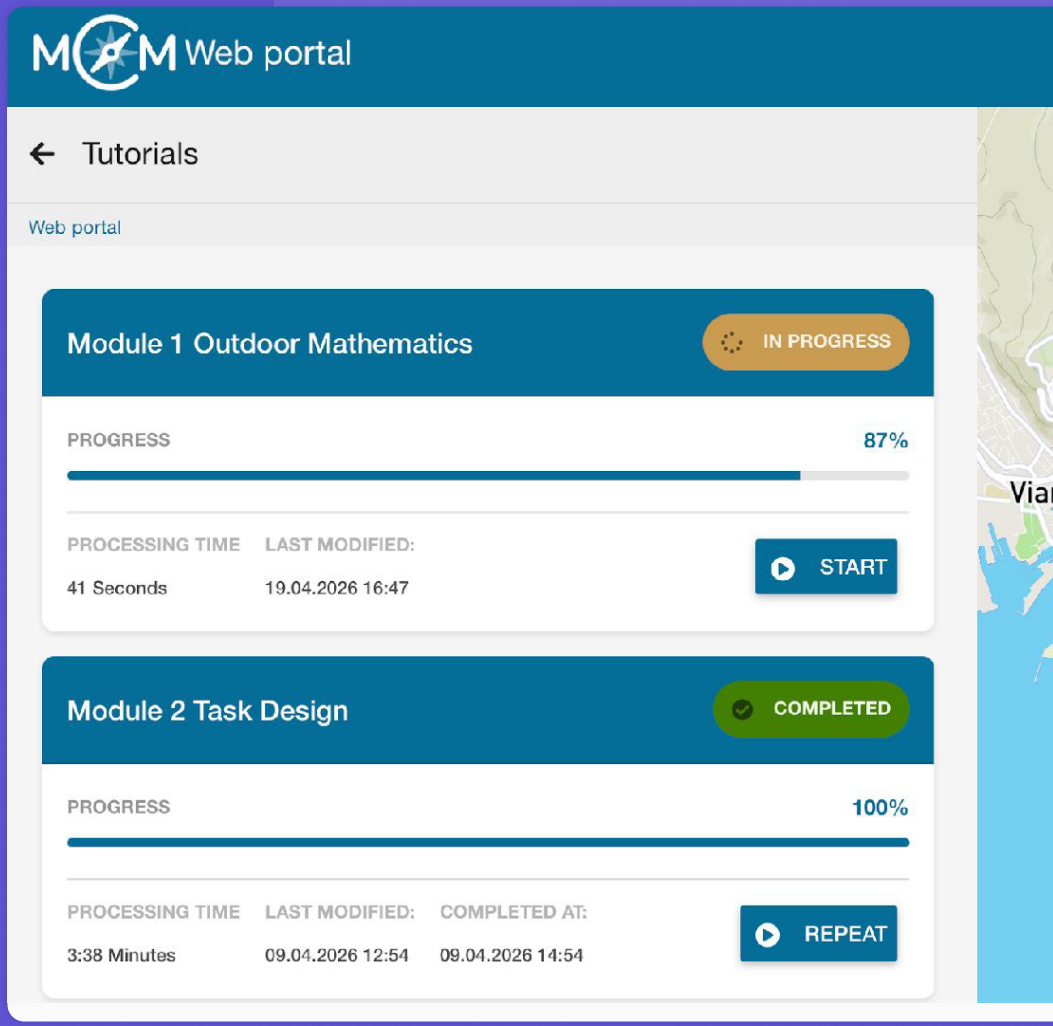
Online Self-Study-Course for Students

A Self-Study Course for students was created, evaluated and implemented into the MathCityMap system.

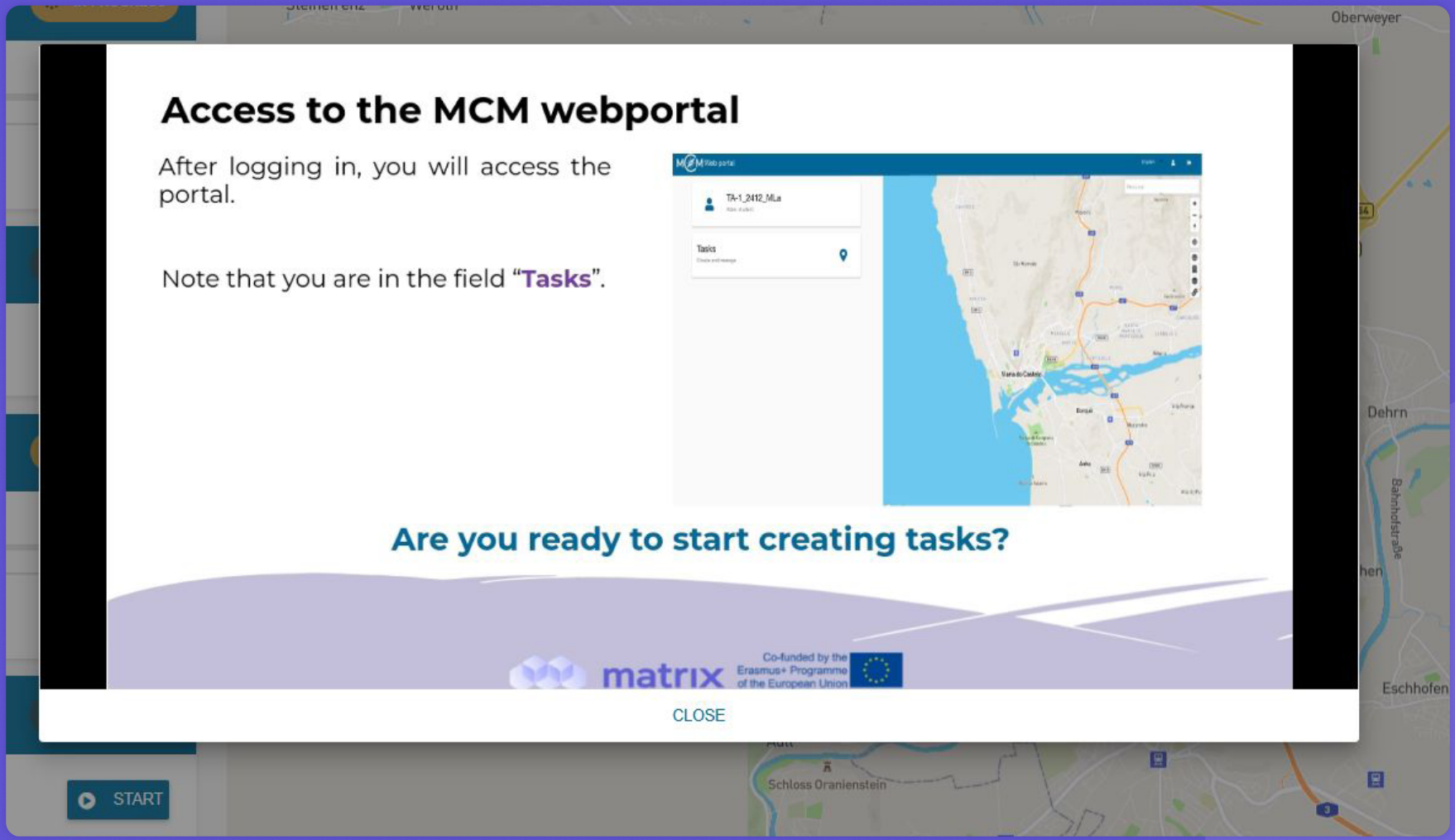
- It can be accessed through a student account and monitored by the respective teacher
- The course is divided into four modules guiding students through the basic ideas and functions of MathCityMap and outdoor mathematics and the creation of tasks as well as giving good feedback on the tasks of peers.



Access to the Self-Study-Course



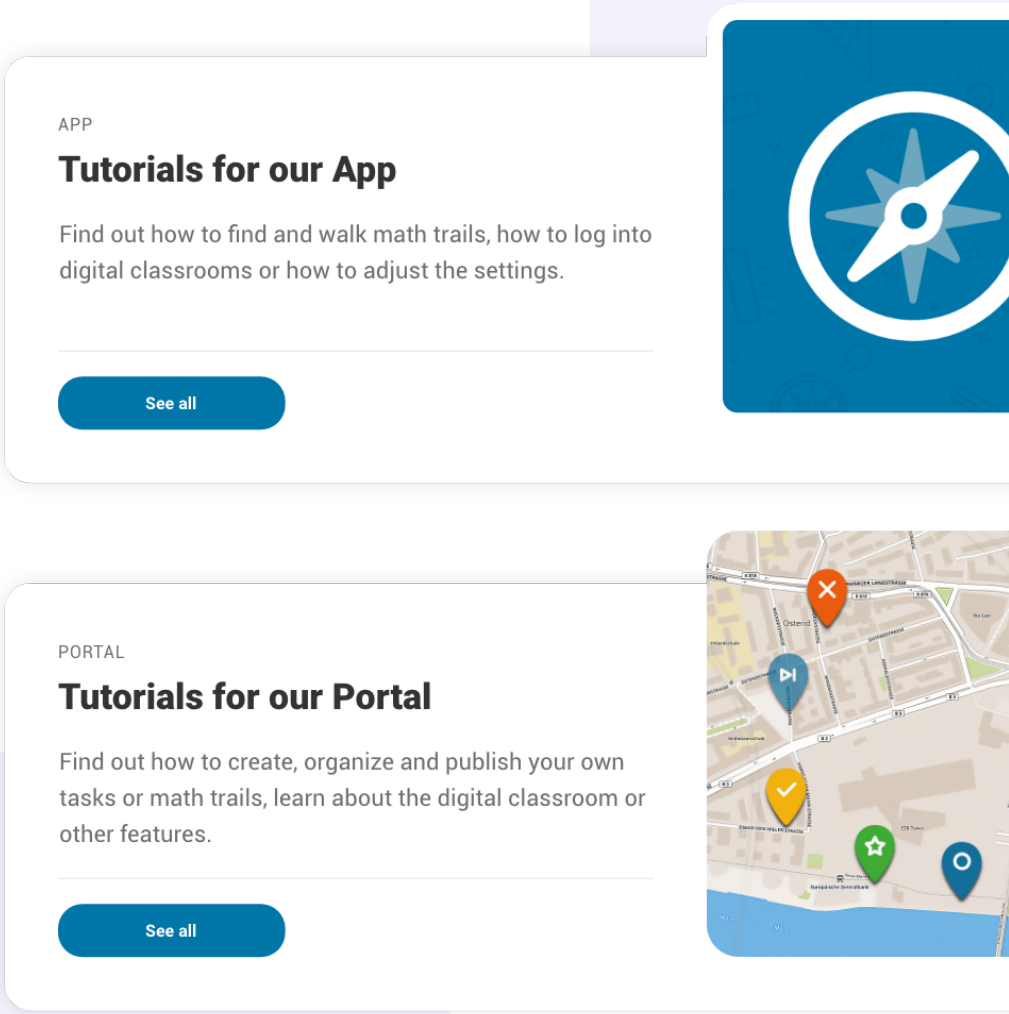
Overview of the modules



Content of the Self-Study-Course integrated in the MCM webportal

Tutorial Section

- As a more interactive and intuitive way for teachers to get to know the different functions of the MathCityMap system and to guide them through their lesson planning with MCM an elaborate Tutorial structure was developed and implemented on the MathCityMap home page.
- The Tutorial section is split in two main sections: Webportal and App with three sub levels each divided by complexity



Create a Digital Classroom

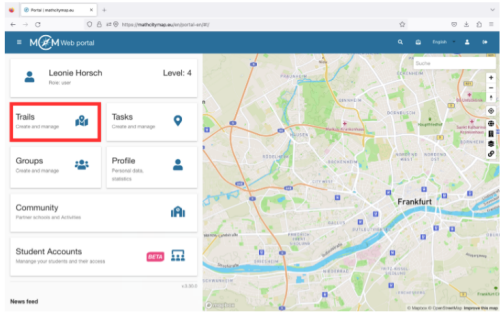
In the MathCityMap web portal, a digital classroom can be set up for a math trail, offering organizational and educational tools. Here you will find a step-by-step guide to creating a digital classroom:

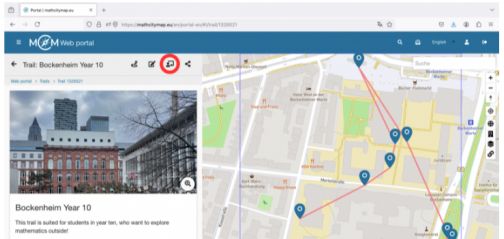
PORTAL

LEVEL 2

Step 1 – Select an Existing Trail

1. To select an existing trail, click on the “Trails – Create and Manage” field. You can also click on “Trails” in the menu bar on the left.
2. A view with your trails will open. Click on the desired trail to open its detailed view.
3. You can also create a digital classroom with public trails. Click on the desired trail to open its detailed view.





Step 2 – Switch to the “Digital Classroom” area

1. In the top left, you will see an icon showing a figure in front of a blackboard. Click on it to open the digital classroom section.
2. Here, you’ll see an overview of already created classrooms (if any), as well as a “New”

Add Trails from a Digital Classroom

PORTAL LEVEL 2

Conducting Lessons with MCM

PORTAL LEVEL 2

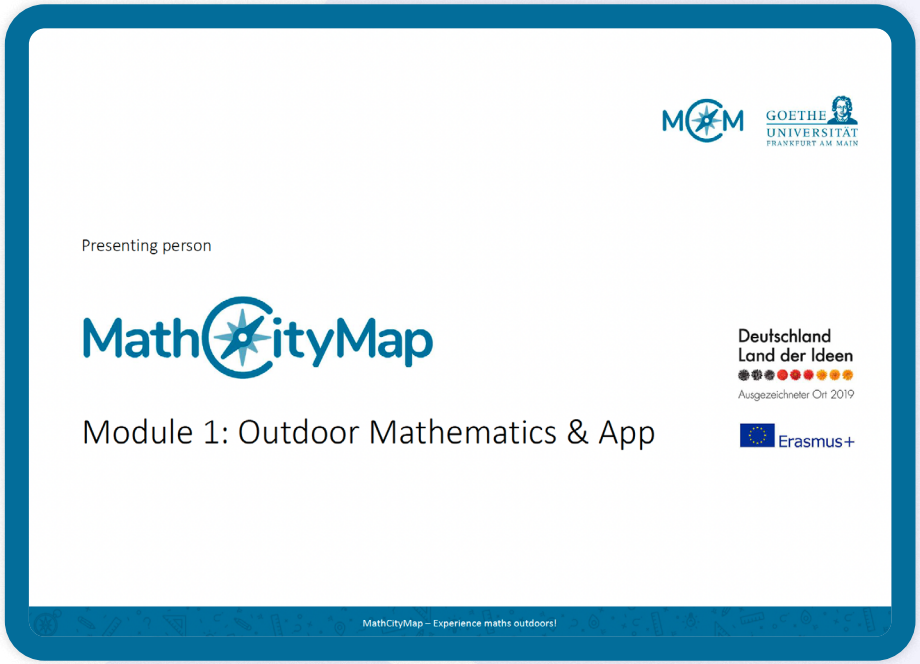
Manage Digital Classroom

PORTAL LEVEL 2

Links to suitable next steps at the end of each tutorial

Teacher training slides

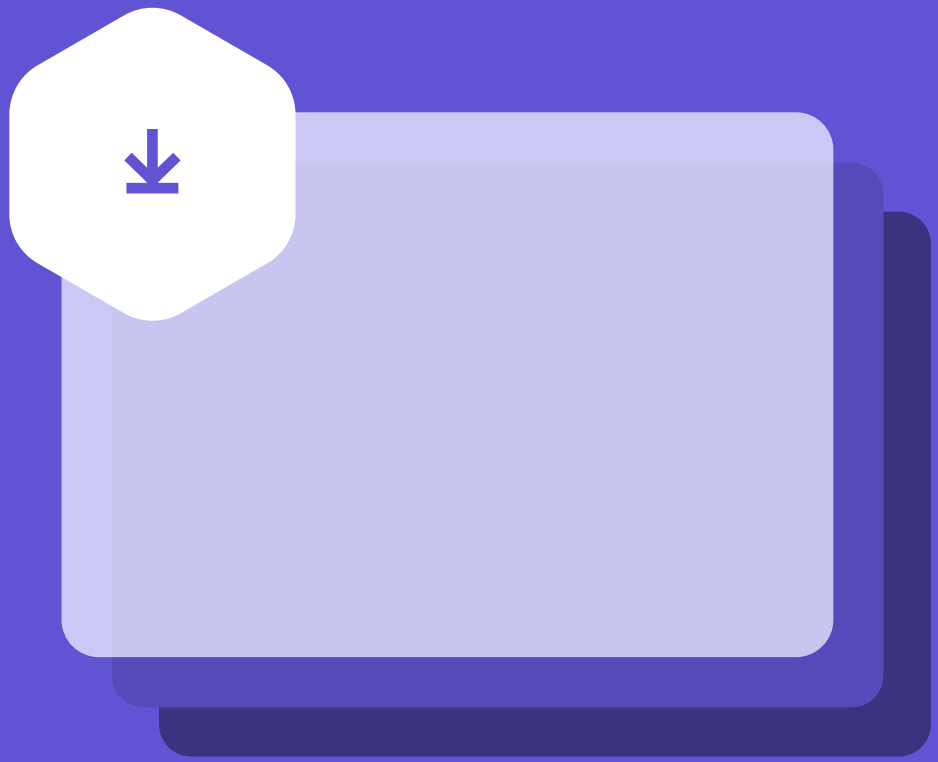
- A pick and mix system of teacher training slides was created and evaluated with six modules in total.
- The slides are available on the MathCityMap home page in the material section beside all other materials that were created within the MATRIX project and beyond.
- The slides can be edited after download to allow mathematics educators easier access for the usage in training sessions.



Teacher training slides

DOCUMENT DOWNLOADS

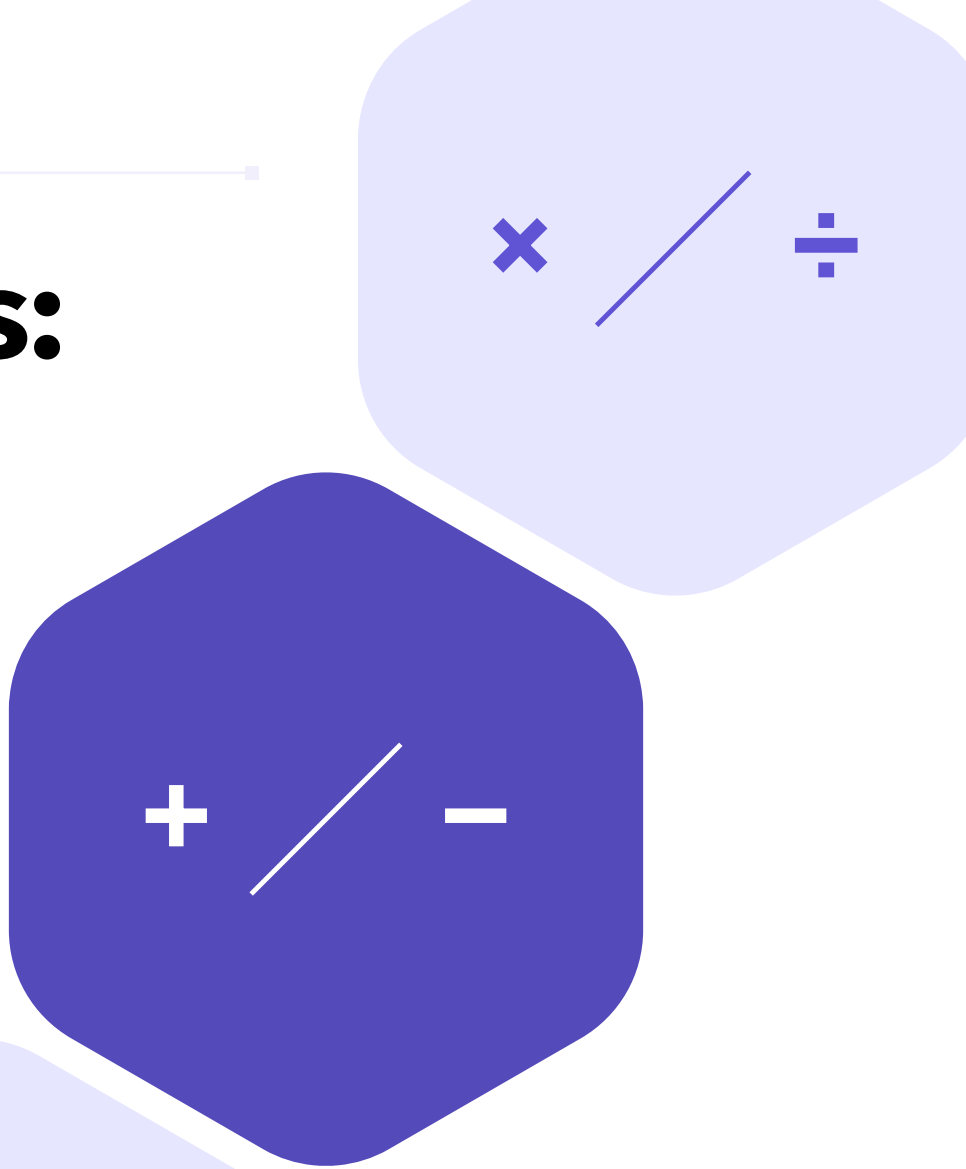
- **ENGLISH** →
- GERMAN →
- PORTUGUESE →
- SPANISH →
- SLOVAK →



Theme Based Trails: Basic Arithmetic

Theme based Trails corresponding to three different topics in the mathematical field of basic arithmetic were created:

- Addition and Subtraction
- Multiplication and Division
- Place Value



Theme Based Trails: Basic Arithmetic

ADDITION & SUBTRACTION

(+/- TRAIL)

- English **4823748**
- German 3427935
- Portuguese 4924806
- Spanish 0728859
- Slovak 0328700



Theme Based Trails: Basic Arithmetic

MULTIPLICATION & DIVISION

(×/÷ TRAIL)

- English **0423745** →
- German 6827934 →
- Portuguese 1224747 →
- Spanish 1628819 →
- Slovak 0228701 →



MATERIAL

Theme Based Trails: Basic Arithmetic

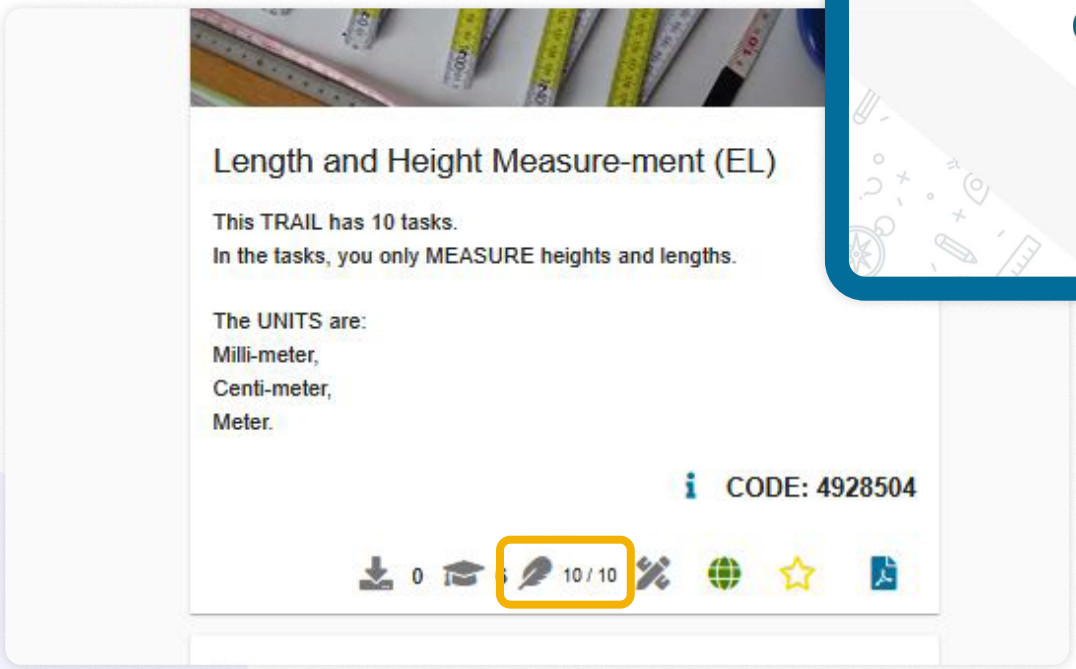
PLACE VALUE

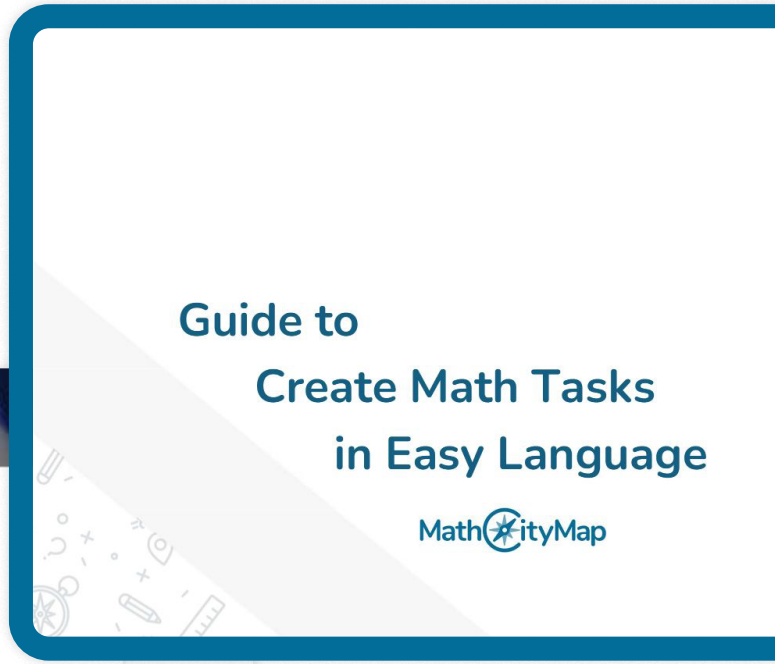
- English **1223743**
- German 1827994
- Portuguese 3424903
- Spanish 0328817
- Slovak 5628856



Easy Language Guidelines and Trails

Easy Language guidelines for the creation of trails were created and exemplary trails were implemented.





Easy Language Trails ENGLISH

Guideline	Basic	EL
Length and Height Measurement	246706	4928504
Geometry in Lyon	287951	0128614
Symmetry	367326	2328609
Statistics in Reyrieux	343208	5928729
Sequences	893340	2728740
Rational Numbers grades 3/4	695110	7828721
Word problems	269924	1528766



Easy Language Trails GERMAN

Guideline	Basic	EL
Messen von Längen und Höhen	123754	0927957
Geometrie Klasse 7-9	399088	5727A932
Symmetrien	377626	5628023
Statistik	154493	6728183
Strukturen und Muster Klasse 3/4	194616	1527992
Strukturen und Muster Klasse 5/6	484617	3527993
Brüche Klasse 5/6	687870	1628329
Text-Aufgaben Klasse 3/4	6910829	2828247



Easy Language Trails PORTUGUESE

Guideline	Basic	EL	
▸ Estatística no Centro Histórico de Viana do Castelo	085897	3829673	→
▸ Números Racionais na ESE de Viana do Castelo 5.º e 6.º anos	675782	2729675	→
▸ Problemas de Cálculo 3.º e 4.º anos	159923	3429674	→
▸ Sequências e Padrões - EB Foz do Neiva	264387	2829672	→
▸ Trilho temático sobre medida 3.º e 4.º anos	039200	1431358	→



Easy Language Trails SPANISH

Guideline	Basic	EL	
▸ Ruta sobre series y patrones en CEIP Giner de los Ríos (Mérida)	055013	8929629	→
▸ Museo etnográfico de Don Benito	4725741	0229628	→



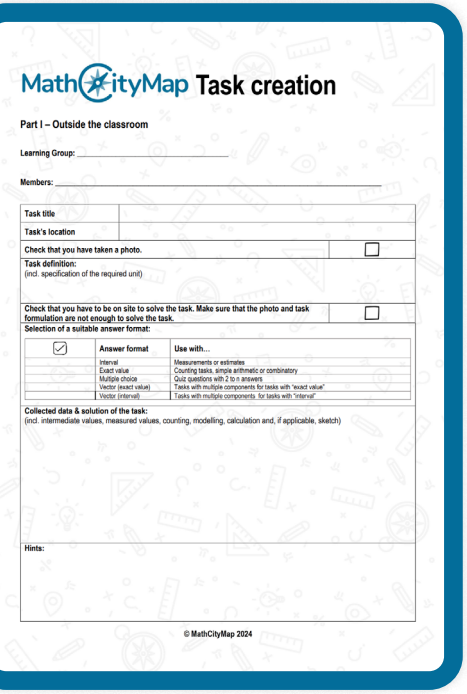
MATERIAL

Easy Language Trails SLOVAK

Guideline	Basic	EL
Pedagogická fakulta UK	1310489	0233889
Svätoplukovo námestie v Nitre	5925219	6932299
Kombinatorika na FPVaI 2. stupeň ZŠ	4818338	1632127
Kombinatorika na FPVaI 1. stupeň ZŠ	2519538	3532125
Prechádzka v átriu UKF	046382	1733891
Park Topoľčianky	7833386	1332235
Druháci v exteriéri	1533749	1232191
Prechádzka v interiéri	1833390	7932190



Additional Teaching Materials


MathCityMap Task creation

Part I – Outside the classroom

Learning Group: _____

Members: _____

Task title	
Task's location	
Check that you have taken a photo.	☐

Task definition:
(incl. specification of the required unit)

Check that you have to be on site to solve the task. Make sure that the photo and task formulation are not enough to solve the task.	☐

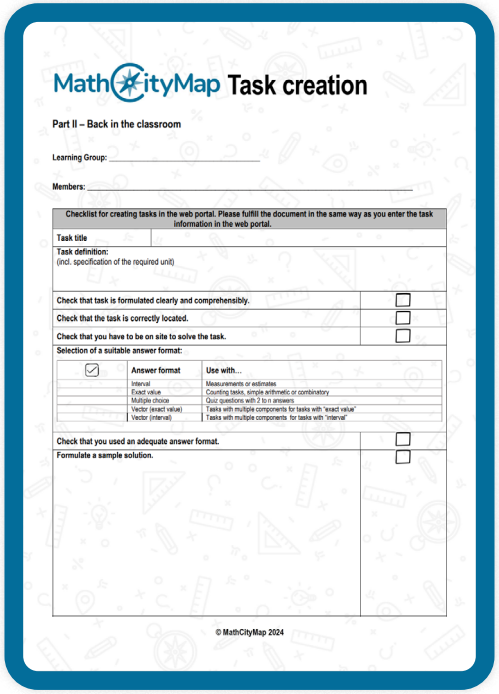
Selection of a suitable answer format:

☑	Answer format	Use with...
	Interval	Measurements or estimates
	Exact value	Counting tasks, simple arithmetic or combinatory
	Multiple choice	Quiz questions with 2 to n answers
	Vector (exact value)	Tasks with multiple components for tasks with "exact value"
	Vector (interval)	Tasks with multiple components for tasks with "interval"

Collected data & solution of the task:
(incl. intermediate values, measured values, counting, modelling, calculation and, if applicable, sketch)

Hints:

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MathCityMap Task creation

Part II – Back in the classroom

Learning Group: _____

Members: _____

Checklist for creating tasks in the web portal. Please fulfill the document in the same way as you enter the task information in the web portal.

Task title	
Task definition: (incl. specification of the required unit)	
Check that task is formulated clearly and comprehensibly.	☐
Check that the task is correctly located.	☐
Check that you have to be on site to solve the task.	☐

Selection of a suitable answer format:

☑	Answer format	Use with...
	Interval	Measurements or estimates
	Exact value	Counting tasks, simple arithmetic or combinatory
	Multiple choice	Quiz questions with 2 to n answers
	Vector (exact value)	Tasks with multiple components for tasks with "exact value"
	Vector (interval)	Tasks with multiple components for tasks with "interval"

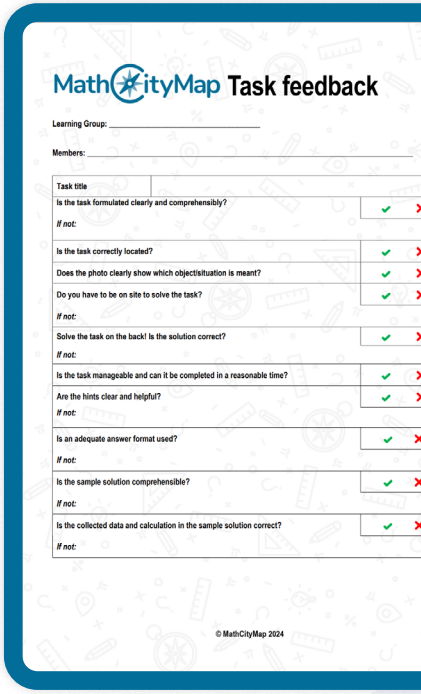
Check that you used an adequate answer format.	☐
Formulate a sample solution.	☐

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Additional Materials for the implementation of MathCityMap in a school lesson were created and tested with the consortium.

Worksheet for ...

- the task search outside
- the task creation inside
- the peer review of tasks


MathCityMap Task feedback

Learning Group: _____

Members: _____

Task title	
Is the task formulated clearly and comprehensibly?	✔ ✘
If not:	
Is the task correctly located?	✔ ✘
Does the photo clearly show which object/situation is meant?	✔ ✘
Do you have to be on site to solve the task?	✔ ✘
If not:	
Solve the task on the back! Is the solution correct?	✔ ✘
If not:	
Is the task manageable and can it be completed in a reasonable time?	✔ ✘
Are the hints clear and helpful?	✔ ✘
If not:	
Is an adequate answer format used?	✔ ✘
If not:	
Is the sample solution comprehensible?	✔ ✘
If not:	
Is the collected data and calculation in the sample solution correct?	✔ ✘
If not:	

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MATERIAL

Additional Teaching Materials

WORKSHEET DOWNLOADS

- **ENGLISH** →
- GERMAN →
- PORTUGUESE →
- SPANISH →
- SLOVAK →



Material Development

matrix-project.eu

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Math Trails with an Inclusive Perspective on Students' Experiences ▪ 09/2023 – 08/2026

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