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Theme-Based Trails

[Geometry and Probability]



MaSCE³



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Definition & Purpose

How could you teach statistics with outdoor math trails?

Don't worry, there are theme-based trail covering these topics and several more!

What is a theme-based trail?

A theme-based trail (TBT) is a collection of mathematical tasks, organized in the form of a trail, about one common topic of the curriculum, which closes the gap to a regular mathematics class.

How can theme-based trails help to develop own math trails?

- TBTs develop math trails focusing on one curricular topic
- TBTs use frequently occurring objects that could be found in schools or in school environments
- TBTs provide a didactical document summarizing the main information regarding each math trail
- TBTs inspire teachers to easily adapt well-tested tasks and math trails to their educational context

Didactical Documents

Available themes (Geometry/Probability)

- Measuring
- Symmetry
- Geometry
- Statistics (Basic & with Augmented Reality)

The TBTs were created in English and adapted to each partner language, i.e., Estonian, French, German, Italian, Portuguese, Spanish – in view of the country's educational contexts.

Didactical document structure

- main concepts & contents
- learning goals
- MathCityMap trail & task codes
- grade(s)
- data to be collected by the students
- objects that inspired the tasks

[Online resources](#) →

Through this presentation, apart from having an overview of the topic exploration, the teacher can access the tasks and trails, through the codes, and consult specific examples of TBTs which can be adapted to their schools or other desired contexts.

Measurement [Grades 3-4 & 5-6]

In this trail, the students work on tasks treating height and length measurement. Only the units millimeter, centimeter and meter are used.

English version 🔗 [246706](#)

Adaptions

Estonian 🔗 [0910645](#)

French 🔗 [0311054](#)

German 🔗 [123754](#)

Italian 🔗 [148353](#)

Portuguese 🔗 [039200](#) / [289201](#)

Spanish 🔗 [299876](#)

Didactical document →

Note: We offer one task for three performance levels, including support tasks and using different answer formats.



Geometry [Grades 5-9]

The theme-based trail on geometry shows various ideas how to work on geometrical tasks outside the classroom.

English version 🔗 [576947 / 287951](#)

Adaptions

Estonian 🔗 [0711134](#)

French 🔗 [288986 / 348969](#)

German 🔗 [399088](#)

Italian 🔗 [0810745 / 0810749](#)

Portuguese 🔗 [569514](#)

Spanish 🔗 [049884 / 279885](#)

Didactical document →

Note: The MathCityMap Task Wizard offers several more ideas on geometrical problems.



Symmetry [Grades 4-5 & 5-6]

In this math trail, the students discover and investigate symmetric objects in their environment. The trail involves tasks on reflection and rotational symmetry.

English version 🔗 [367326](#)

Adaptions

Estonian 🔗 [5811077](#)

French 🔗 [4711055](#)

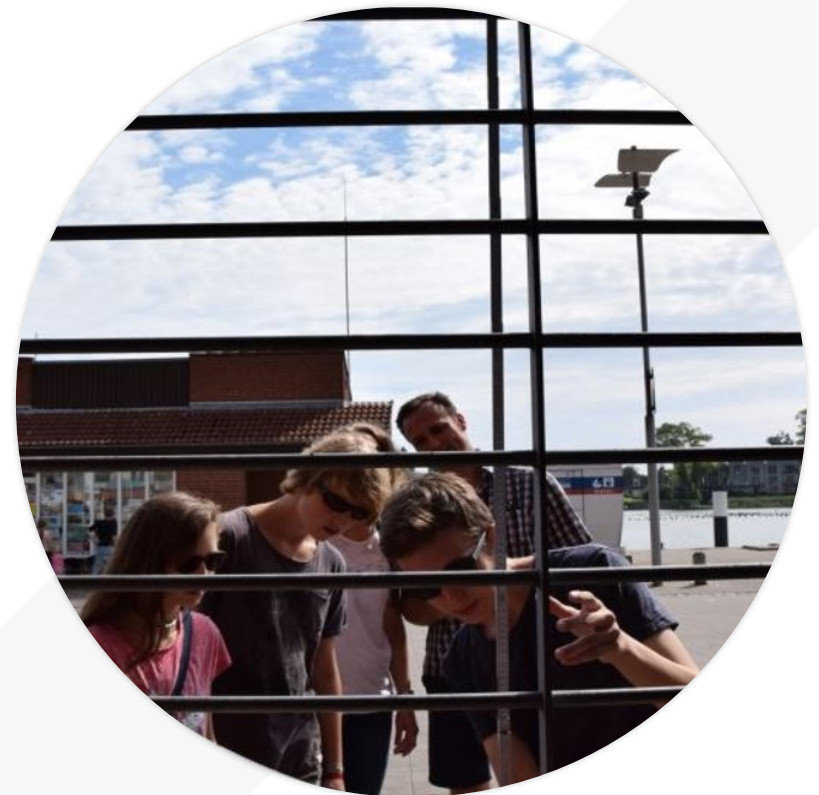
German 🔗 [377626](#)

Italian 🔗 [698771](#)

Portuguese 🔗 [145301](#) / [497514](#)

Spanish 🔗 [259879](#)

Didactical document →



Statistics [all Grades on Secondary Level]

This theme-based trail includes a wide range of tasks on secondary level dealing with probability and statistics.

English version 🔑 [163291](#) / [343208](#) / [895733](#)

Adaptions

Estonian 🔑 [6810731](#) / [0610730](#)

French 🔑 [166164](#) / [066165](#) / [093280](#)

German 🔑 [154493](#)

Italian 🔑 [054991](#) / [454943](#)

Portuguese 🔑 [085897](#)

Spanish 🔑 [565003](#) / [155006](#)

Didactical document →

Note: The MathCityMap Task Wizard offers several more ideas on probability problems.



Statistics [AR / for Higher Education]

This theme-based trail includes a wide range of tasks on higher education level dealing with probability and statistics.

English version 🔗 [0410777](#)

Adaptions

| | | |
|------------|---|-------------------------|
| Estonian | 🔗 | 2811145 |
| French | 🔗 | 5911053 |
| German | 🔗 | 094678 |
| Italian | 🔗 | 2910892 |
| Portuguese | 🔗 | 4910999 |
| Spanish | 🔗 | 6710850 |

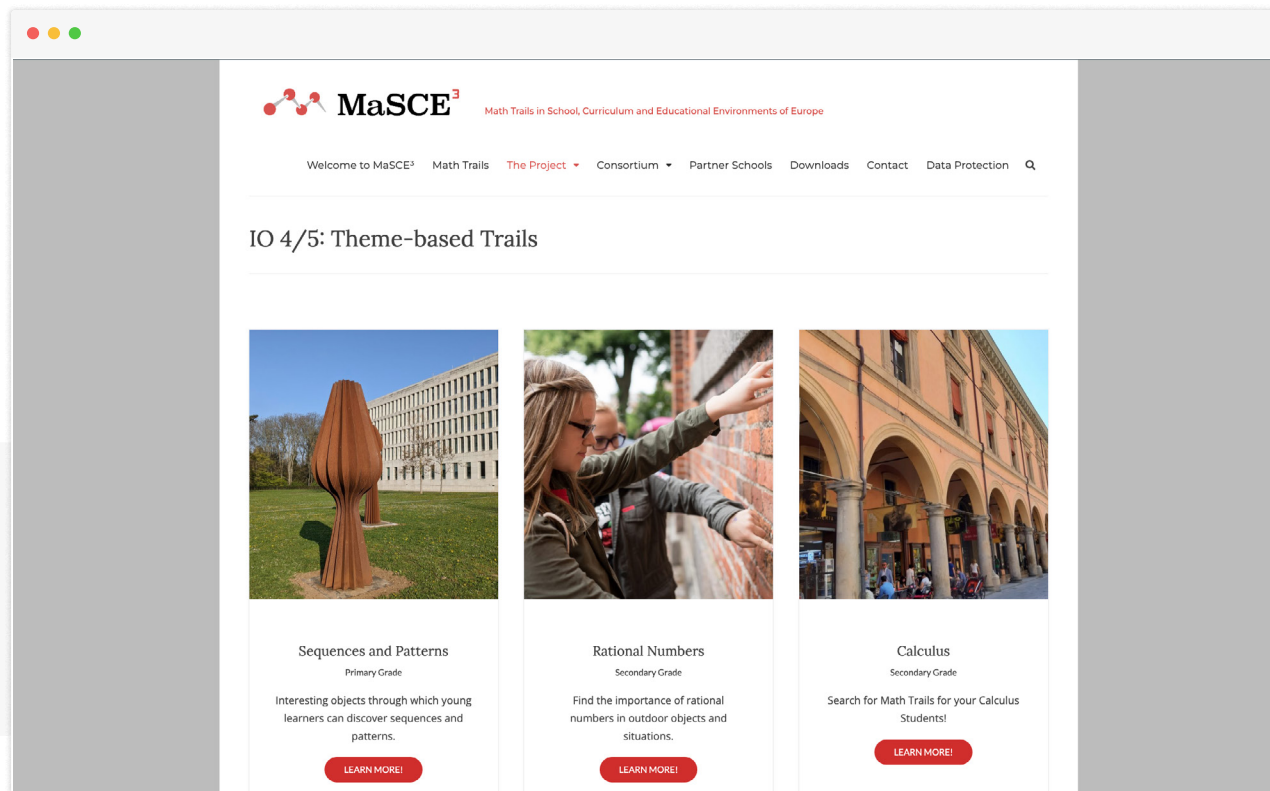
Didactical document →

Note: These math trails contain Augmented Reality (AR) elements. AR offers the possibility to create even more interesting and complex tasks on probability (→ IO3).

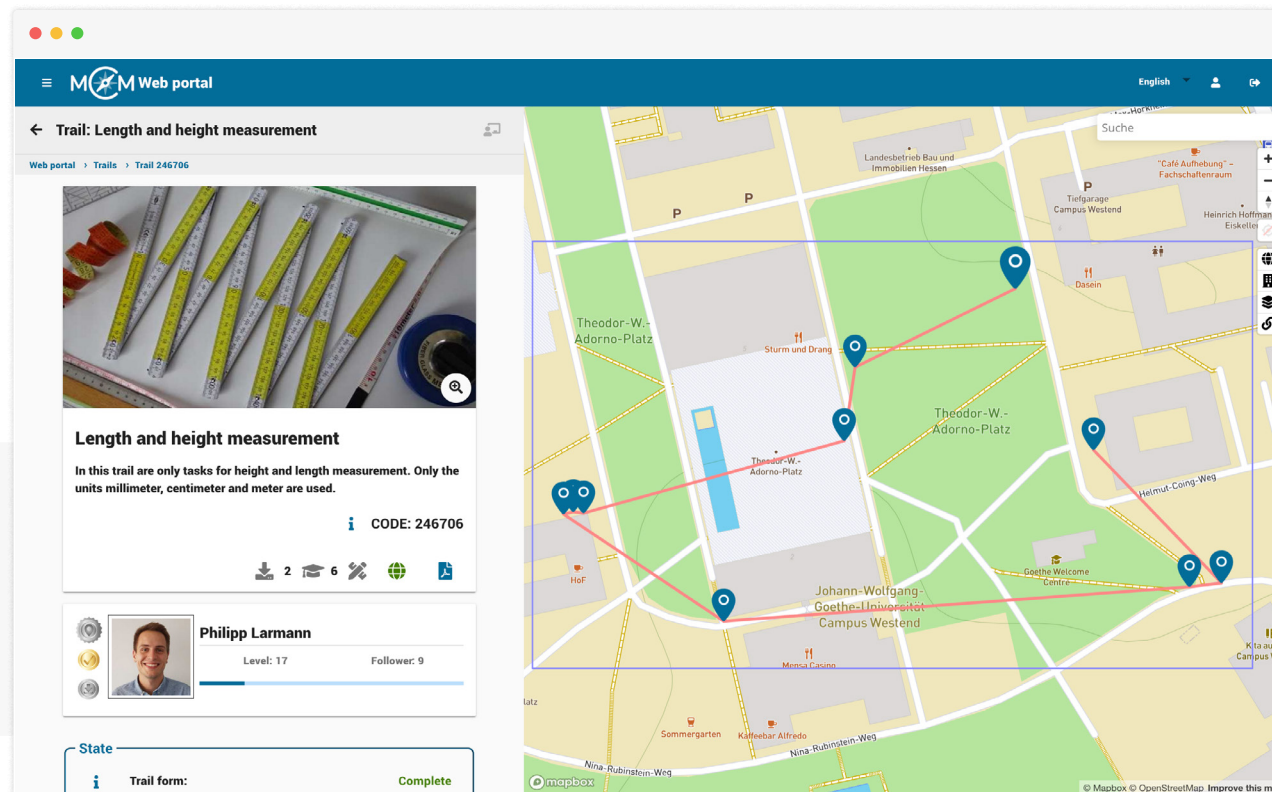


Adjusting TBTs

Choose a specific TBT from the previous chapters or the [web documentation](#).



Adjusting TBTs



The screenshot displays the MathCityMap web portal interface. The main content area shows a trail titled "Trail: Length and height measurement" with a code of 246706. The trail description states: "In this trail are only tasks for height and length measurement. Only the units millimeter, centimeter and meter are used." The trail is visualized on a map of the Johann-Wolfgang-Goethe-Universität Campus Westend, with a red line connecting several blue location pins. The left sidebar includes a user profile for Philipp Larmann (Level: 17, Follower: 9) and a "State" section indicating the trail form is "Complete".

Access the TBT in the MathCityMap web portal, view the tasks and get inspired!

Adjusting TBTs

The screenshot displays a web portal interface for a task titled "Task: Circumference of the tree". The interface is divided into several sections:

- Header:** "MOM Web portal" with a search bar and user profile icon.
- Task Information:** "Task: Circumference of the tree" with a breadcrumb trail: "Web portal > Trails > Trail 246706 > Task 2931850".
- Trail Details:** "Trail: Length and height measurement" with a back and forward arrow.
- Image:** A photograph of a large tree with a search icon.
- Task Description:** "Circumference of the tree" with the instruction: "Measure the circumference of the tree at shoulder height when you are standing next to the tree. Enter the result in cm." Below this are buttons for "Circumference" and "Measure".
- User Profile:** "Philipp Larmann" with "Level: 17" and "Follower: 9".
- Map:** A map of a university campus (Goethe University Campus Westend) with a trail marked by red lines and blue location pins. The trail starts at a tree icon and visits several points labeled "Theodor-W.-Adorno-Platz", "Sturm und Drang", "Mensa Anbau Casino", "Mensa Casino", "Johann-Wolfgang-Goethe-Universität Campus Westend", and "Goethe Welcome Centre".

Adapt the existing tasks by pressing the „copy“ button within only several clicks.

Adjusting TBTs

Make the changes you consider to be necessary. In particular, choose your location and insert an image of the object you have selected.

Finish your adapted version of the tasks with „Create“.

Adjusting TBTs

Copy several of the TBT tasks or develop new ones in order to create your own math trail!

The screenshot displays the MathCityMap web portal interface. The main content area shows a map of Konstanz, Germany, with a custom trail titled "My own theme-based trail" overlaid. The trail is marked with blue circular waypoints and connected by red lines. The interface includes a search bar, navigation icons, and a user profile for Simon Barlovits. The trail is titled "My own theme-based trail" and has a code of 3711151. The user profile shows a level of 39 and 23 followers. The trail form is marked as "Complete".

IO5: Theme-Based Trails

[Geometry and Probability]

🌐 masce.eu / mathcitymap.eu/portal

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