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Theme-Based Trails

[Algebra and Calculus]



MaSCE³



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Definition & Purpose

How could you teach 6th grade rational numbers 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 (Algebra/Numbers/Calculus)

- Sequences and Patterns
- Rational Numbers
- Word Problems
- Calculus

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.

Sequences and Patterns [Grades 3-4]

The tasks involve concepts like counting/subitizing, combinatorial counting, repetition and growth patterns and are destined for grades 3-4.

English version 🔗 [893340](#) / [473351](#)

Adaptions

Estonian 🔗 [475839](#)

French 🔗 [463456](#)

German 🔗 [194616](#)

Italian 🔗 [274961](#) / [035361](#) / [025397](#)

Portuguese 🔗 [264387](#) / [154517](#)

Spanish 🔗 [055013](#) / [145005](#) / [155019](#)

Didactical document →



Sequences and Patterns [Grades 5-6]

The tasks involve concepts like counting/subitizing, combinatorial counting, repetition and growth patterns and are destined for grades 5-6.

English version 🔗 [263342](#) / [693352](#)

Adaptions

Estonian 🔗 [155841](#)

French 🔗 [373455](#) / [283464](#)

German 🔗 [484617](#)

Italian 🔗 [274961](#) / [035361](#) / [025397](#)

Portuguese 🔗 [154392](#) / [174682](#)

Spanish 🔗 [055013](#) / [145005](#) / [155019](#)

Didactical document →



Rational numbers [Grades 3-4]

The tasks involve concepts like fraction as part-whole, operator and measure, different representations of rational numbers and also discrete and continuous contexts for grades 3-4.

English version 🔑 [695110](#)

Adaptions

Estonian 🔑 [0411103](#)

French 🔑 [1711050](#)

German 🔑 [687870](#)

Italian 🔑 [368953](#)

Portuguese 🔑 [675781](#)

Spanish 🔑 [369880](#)

Didactical document →



Rational numbers [Grades 5-6]

The tasks involve concepts like fraction as part-whole, operator and measure, different representations of rational numbers and also discrete and continuous contexts for grades 5-6.

English version 🔗 [485152](#)

Adaptions

- Estonian 🔗 [2711109](#)
- French 🔗 [0711049](#)
- German 🔗 [687870](#)
- Italian 🔗 [368953](#)
- Portuguese 🔗 [675782](#)
- Spanish 🔗 [049881](#)

Didactical document →



Word problems [Grades 3-4]

The tasks involve several concepts like counting, numeric relations, length, area, mass, money and time for grades 3-4.

English version 🔑 [269924](#)

Adaptions

Estonian 🔑 [2410706](#)

French 🔑 [0111056](#)

German 🔑 [6910829](#)

Italian 🔑 [6910774](#)

Portuguese 🔑 [159923](#)

Spanish 🔑 [019982](#)

Didactical document →



Calculus [Higher Education]

The tasks involve several concepts like Differential, Integral and Matrix Calculus for Higher Education.

English version 🔑 [2710506](#)

Adaptions

Estonian 🔑 [3911143](#)

French 🔑 [6711060](#)

German 🔑 [0710746](#)

Italian 🔑 [2810798](#)

Portuguese 🔑 [4710476](#)

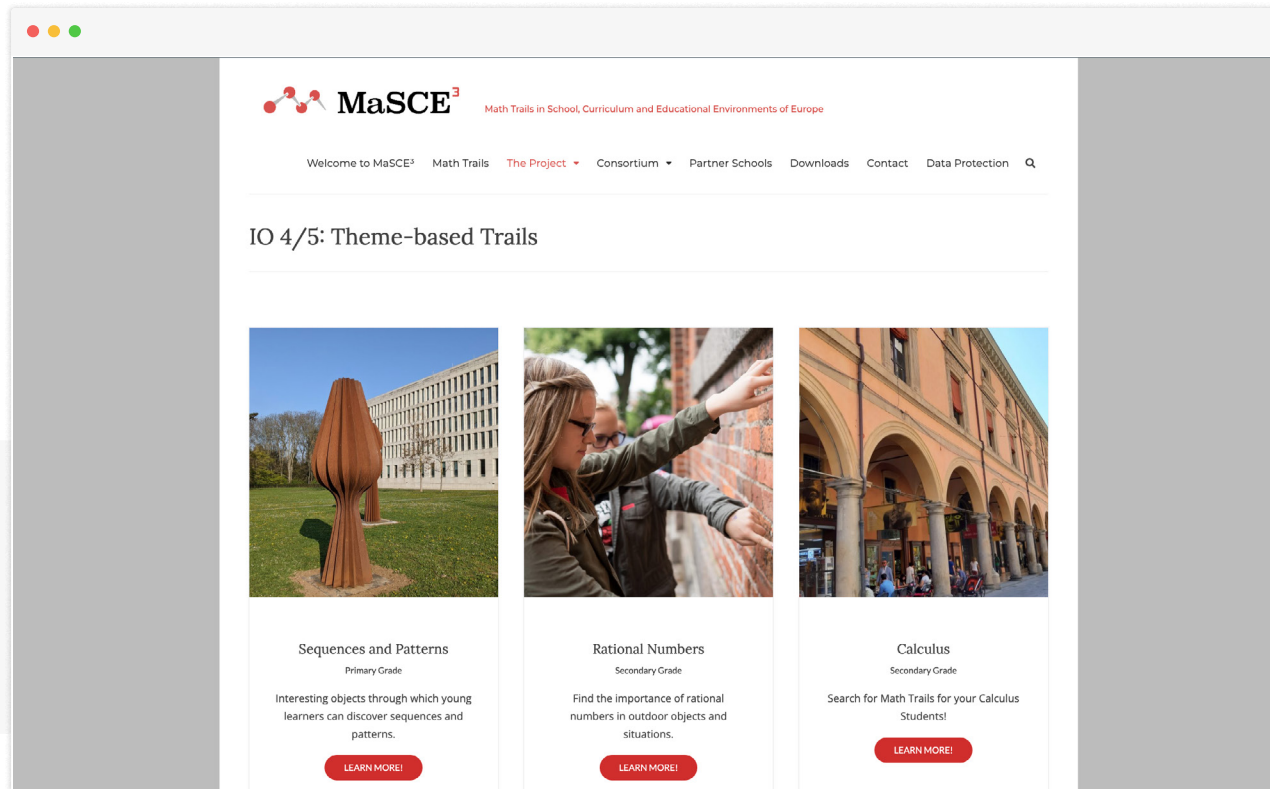
Spanish 🔑 [5610782](#)

Didactical document →



Adjusting TBTs

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



Adjusting TBTs

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

The screenshot displays the MathCityMap web portal interface. The top navigation bar includes the 'MCM Web portal' logo, a language dropdown set to 'English', and a user profile icon. The main content area is titled 'Trail: Length and height measurement' and features a breadcrumb trail: 'Web portal > Trails > Trail 246706'. On the left, there is a thumbnail image of various measuring tools (rulers, tape measures, and a protractor) with a magnifying glass icon. Below the image, the title 'Length and height measurement' is followed by the instruction: 'In this trail are only tasks for height and length measurement. Only the units millimeter, centimeter and meter are used.' The trail code 'CODE: 246706' is displayed, along with icons for download (2), share (6), and other actions. A user profile for 'Philipp Larmann' is shown, indicating a level of 17 and 9 followers. At the bottom, a 'State' section shows 'Trail form: Complete'. The right side of the interface is a map of the Goethe University Campus Westend, with a red line connecting several blue location pins. The map includes labels for 'Theodor-W.-Adorno-Platz', 'Johann-Wolfgang-Goethe-Universität Campus Westend', and 'Goethe Welcome Centre'. A search bar at the top right of the map contains the text 'Suche'.

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 navigation arrows.
- Task Content:** A photo of a tree, the title "Circumference of the tree", and instructions: "Measure the circumference of the tree at shoulder height when you are standing next to the tree. Enter the result in cm." Below the instructions are buttons for "Circumference" and "Measure".
- User Profile:** "Philipp Larmann" with a profile picture, level "Level: 17", and "Follower: 9".
- Map:** A map of a campus area with several blue location markers and red lines connecting them, indicating a trail path. The map includes labels for "Theodor-W.-Adorno-Platz", "Sturm und Drang", "Mensa Anbau Casino", "Mensa Casino", "Johann-Wolfgang-Goethe-Universität Campus Westend", "Gothic Welcome Centre", and "Helmut-Coing-Weg".

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

Adjusting TBTs

Web portal

Title image

Please upload a representative image for your task.

SELECT IMAGE

Basic data

Title -

Circumference of the Plane Tree

Definition of task -

Measure the circumference of the tree at shoulder height when you are standing next to the tree. Enter the result in cm.

120 / 800

Position & AR

Position [click on the map]-

Lat: - Lon -

47.6667455 9.1837173

Augmented Reality Scene

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 a web portal interface for a math trail. The main content area features a map of a city (Konstanz) with a red trail path and several blue location markers. The left sidebar contains a blue header with the text "My own theme-based trail" and a magnifying glass icon. Below this, there is a section titled "My own theme-based trails!" with a sub-header "I adapted various tasks provided by the MaSCE³ team and quickly created by own TBT!". A code "CODE: 3711151" is displayed, along with icons for download, share, and other actions. The user profile section shows a profile picture, the name "Simon Barlovits", a level of 39, and 23 followers. At the bottom, there is a "State" section with a "Trail form:" and a "Complete" button.

IO4: Theme-Based Trails

[Algebra and Calculus]

🌐 masce.eu / mathcitymap.eu/portal

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