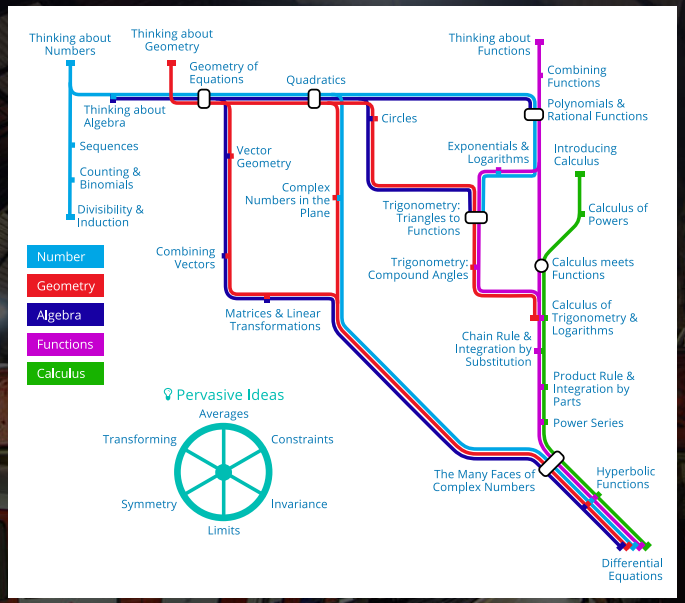
underground mathematics

Rich resources for teaching
A level mathematics

undergroundmathematics.org

info@undergroundmathematics.org
@UndergroundMath



What is Underground Mathematics?

We provide free web-based resources that support the teaching and learning of post-16 mathematics.

These resources support teachers in the classroom. They help students build firm foundations for mathematical understanding by connecting ideas and developing techniques.

We are based at the University of Cambridge and funded by a grant from the UK Department for Education.

Visit undergroundmathematics.org to learn more.

UNIVERSITY OF CAMBRIDGE

Department for Education

Why use Underground Mathematics?

Rich resources

Designed to stimulate students' curiosity and elicit discovery of ideas, the resources can be used flexibly.

Promote discussion

Resources encourage students to pose questions, reflect and collaborate, deepening their understanding.

Developed with teachers

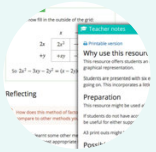
Partner schools across England work closely with the project team, trialling resources and giving feedback.

Ready to use

Resources have been designed for classroom use and may include card sets and worksheets.

Emphasis on connections

The tubemap shows multiple connections between topics. Pervasive ideas provide additional connections.



Solutions and teacher notes

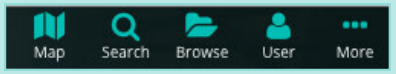
Solutions are provided which also offer questions and suggestions. Brief teacher notes provide extra support.

How-to guide

Navigating the site

Each resource is located at a station, and stations are located on lines on our tubemap.

The map can be accessed from the home page or the main menu in the top right, which also allows you to search and browse for resources.



By clicking More you can find out more about us, visit Your mathematical classroom or access news and events etc on the Hub page.

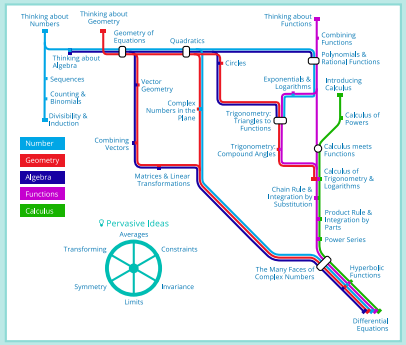
To return to the home page, click the logo in the top left or click More then Home.

Read on for more details.

How-to guide

The map

The mathematics has been organised along a system of tube lines, which reflect big themes that run through the subject. The tubemap offers a way to navigate to resources for teaching a particular area of mathematics, by clicking on the appropriate station name. Some stations are in development or not ready for viewing, denoted by the icons 🔨 or ⛔.

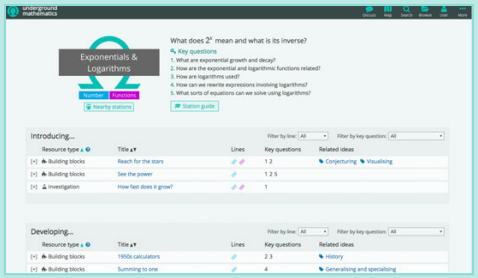


How-to guide

Stations

Each station features an overarching question that could be used to stimulate curiosity. A number of key questions summarise the ideas that arise in the resources, expanded upon in the station guide.

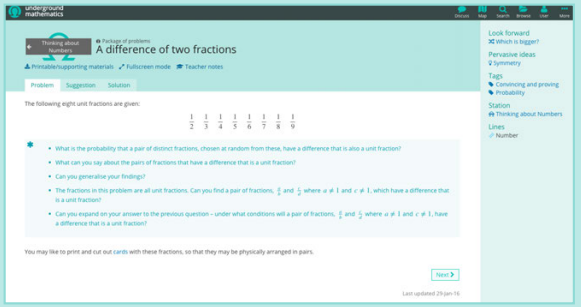
Resources are in three groups: the first introducing new ideas, the second developing these ideas or earlier work and the third offering past exam questions requiring non-routine thinking.



How-to guide

Resources

The resources are divided into sections. Some may have a warm-up followed by a larger task, and others may have a problem followed by a suggestion of how to tackle it. Almost all resources contain a solution or a “Things you might have noticed” section. Further support is offered in the teacher notes. Resources are classified into twelve resource types to indicate what they might be used for.

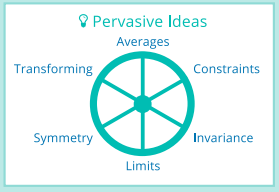


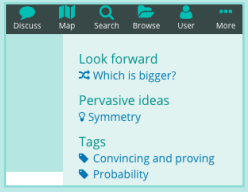
How-to guide

Pervasive ideas

There are many important ideas arising throughout mathematics that do not fit naturally at a station on our tubemap because they permeate mathematics at this level. We have chosen to highlight some of these in our pervasive ideas.

By clicking on a pervasive idea you will find a description of how the idea arises within the resources. If pervasive ideas are highlighted in a resource they appear in the sidebar (or bottom-bar on a small screen) and in the list of resources at the station (on a wide screen).





How-to guide

Registering as a user

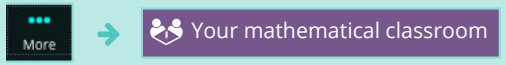
Registering as a user gives you access to the 'Your resource collection' feature. This allows you to save resources for later by clicking the star next to the resource title to add them to your resource collection. You can also organise resources into subcollections, create combined PDF files and add notes to yourself on resources.

To register as a user, click the User button in the main menu then click Register.

How-to guide

Your mathematical classroom

The More menu in the top right allows you to access Your mathematical classroom, the teacher support area where you can find out more about using our resources.



Here you can find details of professional development opportunities, ideas for using our resources, and read about teachers' experiences with Underground Mathematics.

The Bundles page contains small, carefully selected, collections of resources that have a particular focus or goal. These resources can be used in the suggested sequence to take students on a particular mathematical journey.

Resources in action gives detailed teacher support for certain resources, including video of students tackling these tasks and examples of students’ work.