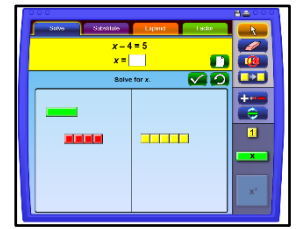


## VIRTUAL MANIPULATIVES

### Algebra

There are several algebra tools that may support students' understanding of algebraic concepts. The National Council of Teachers of Mathematics (NCTM) Illuminations site has a great interactive for algebra tiles that includes some examples for students to complete.

<https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Algebra-Tiles/>



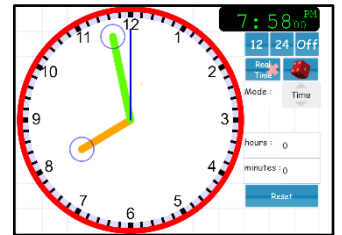
MathsBot also has an algebra tile interactive as well as an alternative tool known as algebra discs that allow students to model and solve various algebraic problems.

<https://mathsbot.com/manipulatives/discs>

### Clocks

Visnos (Visual Numbers) has several interactive tools including a clock application. This tool displays the time in both analogue and digital format and has a random time generator (shown as a dice button) which could be used for students to identify times.

<https://www.visnos.com/demos/clock>



### Counters

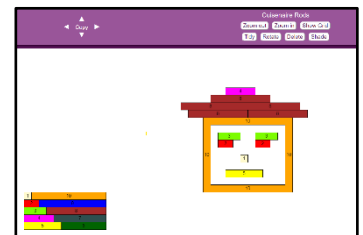
Toy Theater has several virtual tools that provide examples of counters including coloured counters, double-sided counters and teddy bears. These counters can be placed and removed from a grid. There is also an option to include an equation.

<https://toytheater.com/color-counters/>

### Cuisenaire Rods

There are several Cuisenaire rods tools available online. This one from MathsBot includes the option to delete and copy just one of the rods (many of the others only allow you to delete the entire project). It also has the option to show/hide the number value of the rods, modify the starting value of the white rod (to another whole number) and show/hide a grid.

<https://mathsbot.com/manipulatives/rods>



### Dice

Toy Theater has an interactive tool that allows you to choose from seven types of dice (ranging from 6-sided to 20-sided) and allows you to roll up to five dice at a time. Unlike other dice tools, these dice resemble their physical counterparts, so may be more familiar for students.

<https://toytheater.com/dice/>



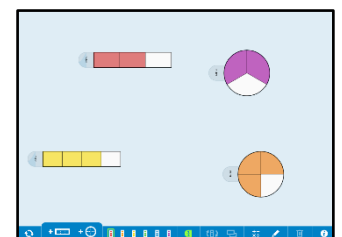
This dice tool from VirtuWorld does not look as visually appealing as other applications but has the option to choose any number side dice (e.g. 1 to 999) and roll up to seven dice at a time. It is basically a random number generator.

<https://dice.virtuworld.net/>

### Fractions

The Math Learning Center has a fraction tool that allows users to model fractions of objects as both a rectangle and a circle. It has an option to include a label on the side of the object what automatically updates as the fraction is coloured.

<https://apps.mathlearningcenter.org/fractions/>



Math Playground has an interactive fraction tool that works as a balance that may help students to identify equivalent fractions. Students choose fractions to drag onto different sides until the tool balances.

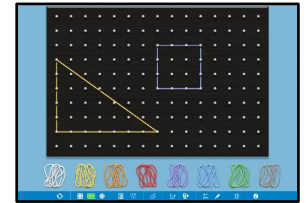
[https://www.mathplayground.com/Scale\\_Fractions.html](https://www.mathplayground.com/Scale_Fractions.html)

# CHOOSEMATHS

### Geoboard

This tool is based on a geoboard (a grid of pins and rubber bands used to make shapes and patterns). It includes different sized boards and a range of colours for the rubber bands.

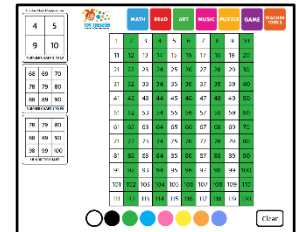
<https://apps.mathlearningcenter.org/geoboard/>



### Number Charts

This number chart from Toy Theater allows you to colour different cells. You can clear all the colours or use the white colour to remove any mistakes. There are four different charts available.

<https://toytheater.com/120-chart/>



Math is Fun also has counting charts that can be coloured. It includes more chart options to modify the size and layout of the chart.

<https://www.mathsisfun.com/numbers/number-chart.php>

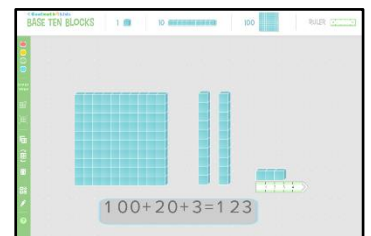
Splat Square has an interactive counting chart that allows users to 'splat' (i.e. place a blob of paint) different numbers in a range of colours. It comes with cool sound effects that may appeal to younger students.

<https://www.primarygames.co.uk/pg2/splat/splatsq100.html>

### MAB (Multi-base Arithmetic Blocks)

This version of base ten blocks from Cool Math 4 Kids only has the one, ten and 100 blocks. It does include a ruler and the option to add text or drawings.

<https://www.coolmath4kids.com/manipulatives/base-ten-blocks>



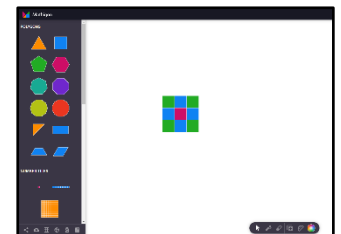
This tool from MathsBot has blocks (called Dienes Blocks here) from 1 to 1000 in base 10. It has the option to copy and delete individual blocks, show/hide a place value chart and change the base. It does not allow you to include text or drawings.

<https://mathsbot.com/manipulatives/blocks>

### Mathigon Polypad

This tool includes a range of virtual manipulatives, including polygons, place value blocks, fraction tiles and tangram pieces. The shapes can be recoloured, copied and rotated and there is an option to download the canvas as an image.

<https://mathigon.org/polypad>



### Pattern Blocks

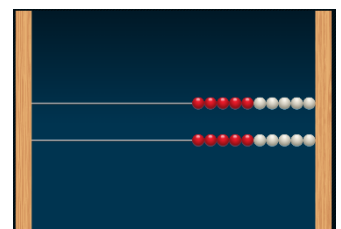
This tool from the team at Math Learning Center is based on the traditional wooden pattern blocks found in many primary classrooms. The tool includes a simple how to guide as well as options to re-colour, re-size and rotate the shapes.

<https://apps.mathlearningcenter.org/pattern-shapes/>

### Rekenraks (Counting Frames)

Rekenraks are a type of counting frame only involving beads of two colours (usually red and white). They can be used to show different ways to model or partition numbers. This example from Math Learning Center allows you to mask (hide) some of the beads to encourage students to calculate the missing amount. There are also options to include text, images and equations.

<https://apps.mathlearningcenter.org/number-rack/>

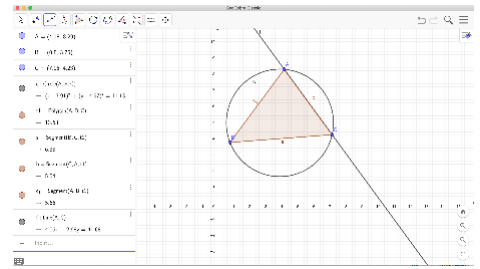


Didax has interactive versions of both a 20-bead and 100-bead rekenraks. These tools only show the beads and do not have any other options, such as drawing or recording numbers.

<http://www.didax.com/apps/rekenrek/>

## ONLINE TOOLS

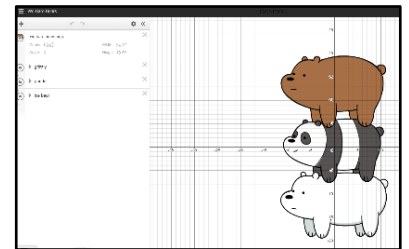
**Geogebra** is a free tool that can be used online or downloaded. It can be used for graphing, geometry, solving equations and creating 3D interactives. It includes classroom resources and links to many downloadable files created by other members of the Geogebra community. <https://www.geogebra.org/>



**Desmos** is a similar application to Geogebra. It also has a vast online community, can be downloaded as an app and has further options to create more artistic designs and games. <https://www.desmos.com/>

**Tinkercad** is a free design application that covers 3D image design, coding and electronics. <https://www.tinkercad.com/>

**Sketch Up** (Free Version) is 3D modelling software which allows users to create anything from buildings to models of furniture. <https://www.sketchup.com/plans-and-pricing/sketchup-free>



## FURTHER INFORMATION

**Cool Math 4 Kids** has four free interactives for students: Base 10 Blocks (MAB), Tens Frame, Number Lines and Pattern Blocks. <https://www.coolmath4kids.com/manipulatives>

**Didax** has several basic virtual manipulatives including Unifix cubes, number lines and counters. The tools can be used to model a problem, but there is no option to add text or drawings. It may be better suited to younger students. <https://www.didax.com/math/virtual-manipulatives.html>

**MathsBot** Tools for Teachers website has several manipulatives, including dice, dominoes, number charts and algebra tiles. <https://mathsbot.com/>

The **Mathigon** website has several interactive tools, including tools related to prime numbers, tessellations and Pascal's Triangle. <https://mathigon.org/>

The **Math Learning Centre** has a range of free tools, including number lines, clocks and tens frames. <https://www.mathlearningcenter.org/resources/apps>

**Math Playground** has several interactive tools and games pattern blocks, number charts and factor trees. [https://www.mathplayground.com/math\\_manipulatives.html](https://www.mathplayground.com/math_manipulatives.html)

The **National Council of Teachers of Mathematics (NCTM)** has several interactives on their Illuminations site, including tools to support the teaching of fractions, geometric solids and adjustable spinners. <https://illuminations.nctm.org/Search.aspx?view=search&type=ac>

**The Toy Theater** site has a huge range of virtual manipulatives from counting charts to fraction strips. <https://toytheater.com/category/teacher-tools/virtual-manipulatives/>

**Visnos** (Visual Numbers) has a number of mathematical demonstrations and interactive tools made using Desmos. It includes everything from clocks to fractions to a Sieve of Eratosthenes tool. <https://www.visnos.com/demos>