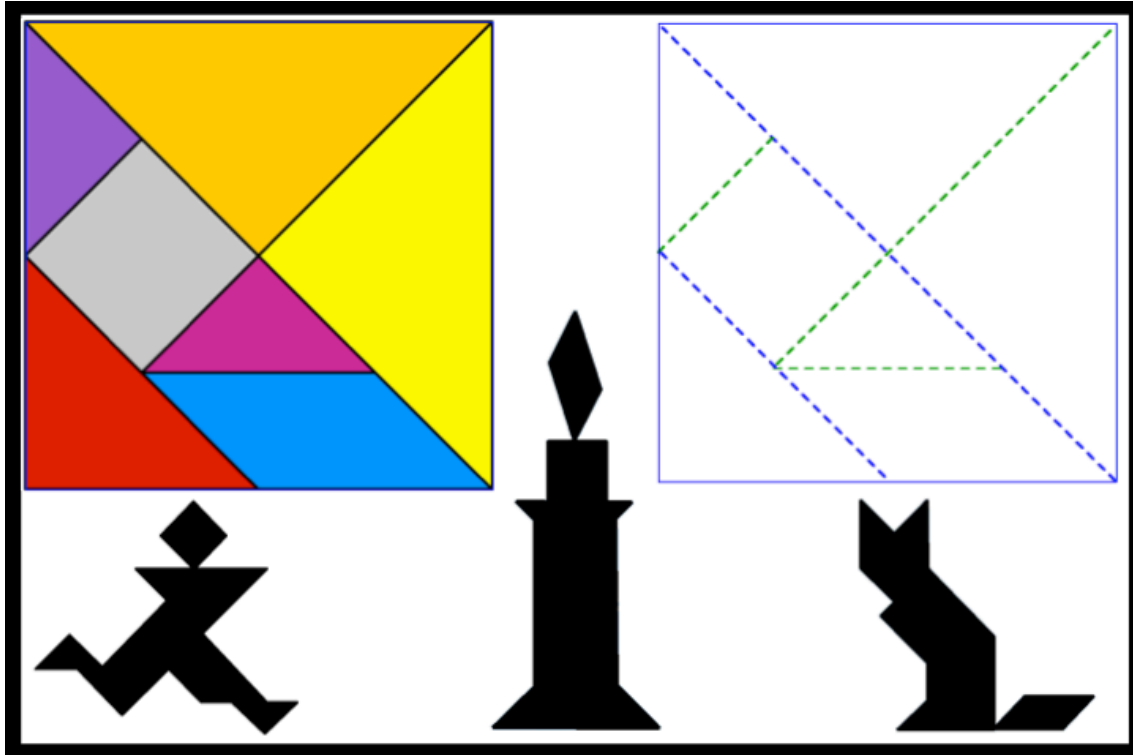


Tangrams



A Spire Maths Fractions Activity

<https://spiremaths.co.uk/tangram/>

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Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All Tangrams for fractions (updated March 2017)

Activity for Upper KS2 or early KS3.

Practical activity to make the tangram, work out the area of each piece in relation to the original starting square (one unit of area) and then prove that the results are correct. There are then challenges to create some shapes from their silhouettes (not always as easy as it seems).

When folding lines, place a ruler along the intended line of the fold and use this to help fold the paper.

For interactive files to create tangrams see Problems3r file (see IWB slides below 9) at:

<https://spiremaths.co.uk/ia/?target=Problems/>

Problems 3, 4 and 4r also have pages related to tangrams (see IWB slides below 9).

For flipchart and this pdf go to:

<https://spiremaths.co.uk/tangram/>

Four sites for tangrams included (see index above). Little historical information known (Wikipedia has some) as too does the Trol resource.

Note about Chrome browser and interactive files

If you use Chrome as your browser then these interactive files might not work (you are instead asked if you want to Keep or Discard the files, say Discard and go to the link below and follow the instructions to enable the relevant plugin. Mac and Windows instructions are both there: scroll down. You only have to do this once.

You will need relevant permission to do this on the computer.

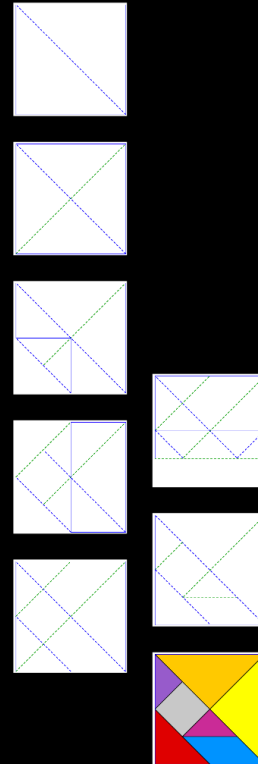
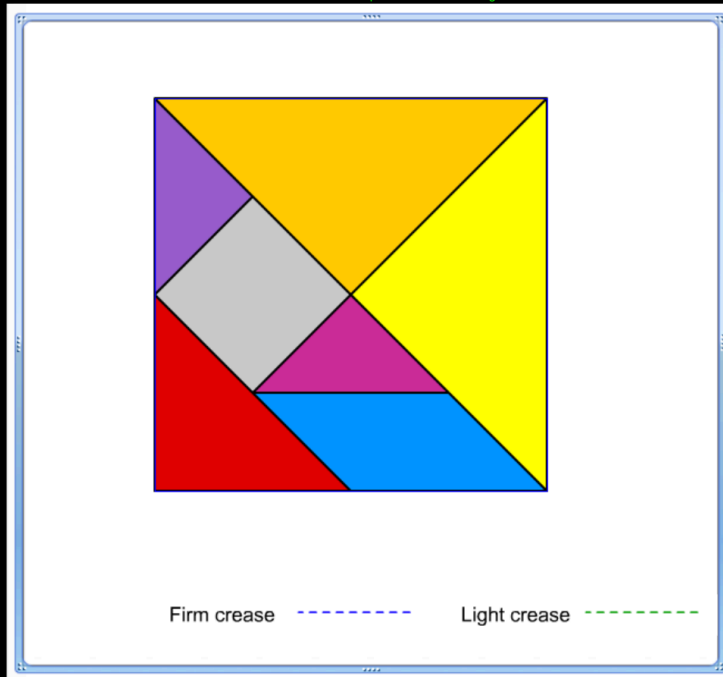
<https://helpx.adobe.com/flash-player/kb/enabling-flash-player-chrome.html>

IWB slides

Page1	Fold a square into the standard tangram shape using these 'origami' style instructions.
2	Smaller versions of instructions but all on one screen.
3	Alternative method using 8 by 8 grid.
4	The coloured pieces on this page can be moved around. What fraction is each piece of the original unit square? Prove the conjectures.
5	The black pieces on this page can be moved around.
6	Answer to the fractions question.
7	Pictures to make (with pieces of size here).
8	More pictures to make (with pieces of size here) including the starting square – making this is a challenge for some.
9	Spire Maths Interactive file screens
10	Other good tangram resources.
11	Our iPhone and iPad apps and links to them.

Tangram Template 1

Click each red button in turn to see the next step for folding the tangram shapes.
These are also shown under the pink rectangle.
The coloured square shown is the tangram.



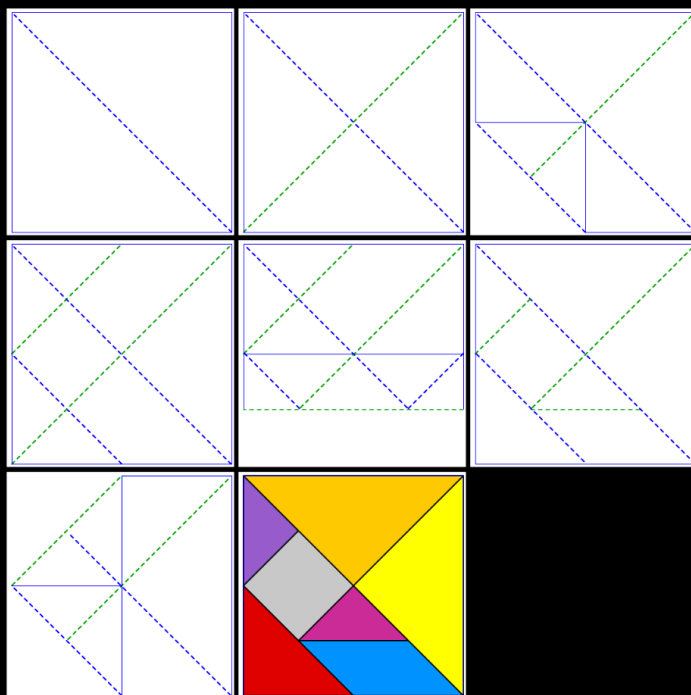
Our Maths APPs

Spire Maths

MathsTube for
maths videos

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(Stoke) Ltd

Tangram Template 1



Our Maths APPs

Spire Maths

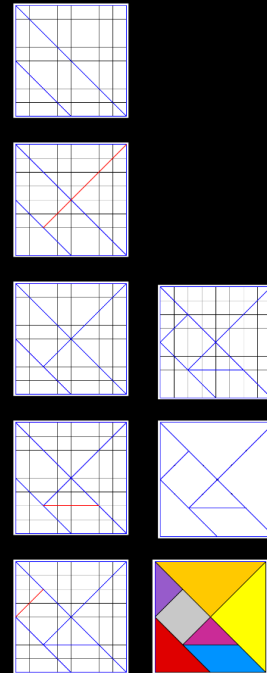
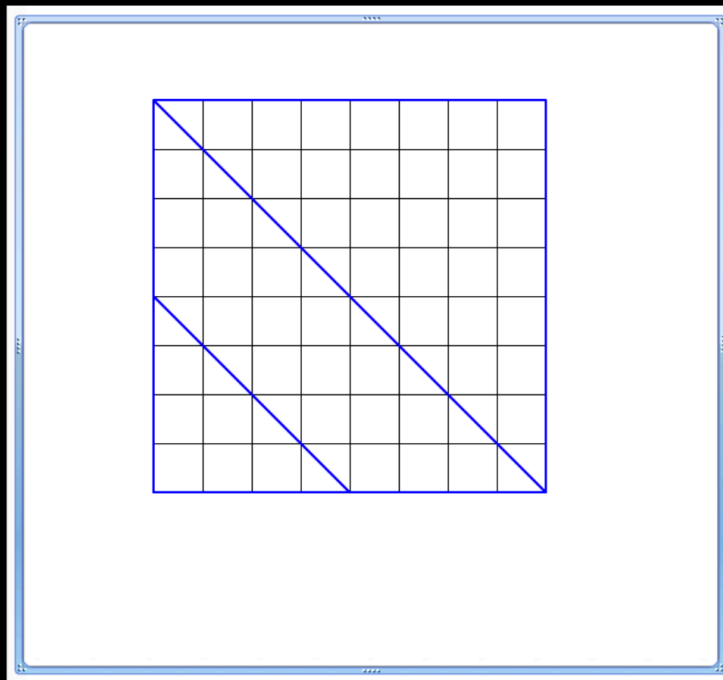
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Tangram Template 2

These show how the tangram can be drawn on 8 x 8 cm paper.



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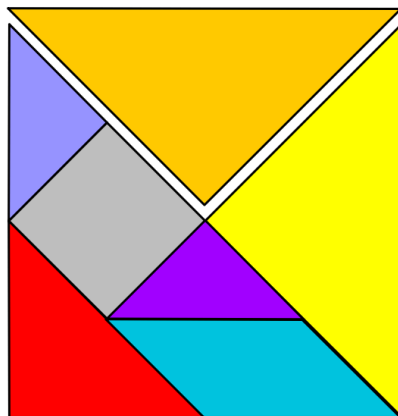
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Tangram Pieces

Each part can be moved.

The area of the complete square made of the seven pieces. Find the areas of each of the seven pieces as fractions. Prove that you have the correct values.



Our Maths APPs

Spire Maths

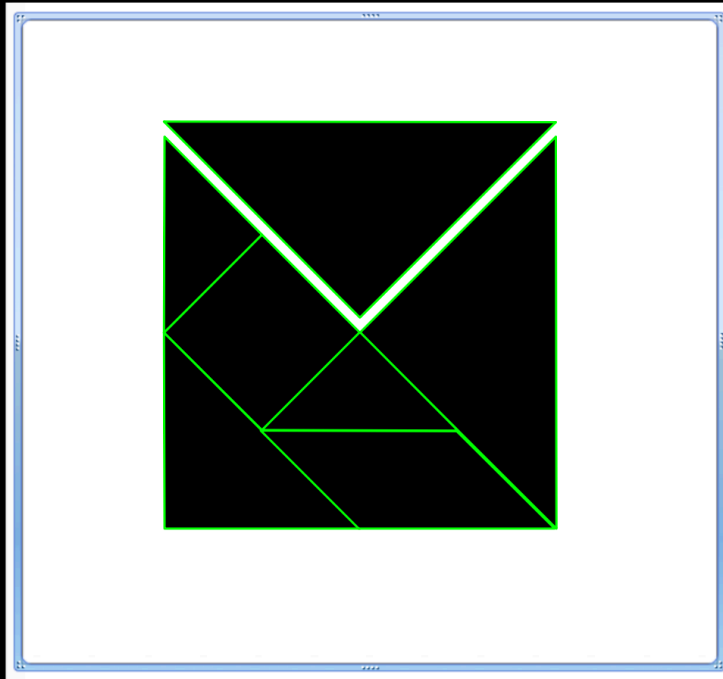
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Tangram Pieces

Each part can be moved.



Our Maths APPs

Spire Maths

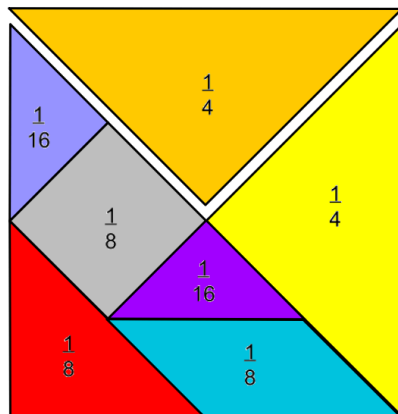
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Tangram Pieces

Each part can be moved.

The area of the complete square made of the seven pieces. Find the areas of each of the seven pieces as fractions. Prove that you have the correct values.



Our Maths APPs

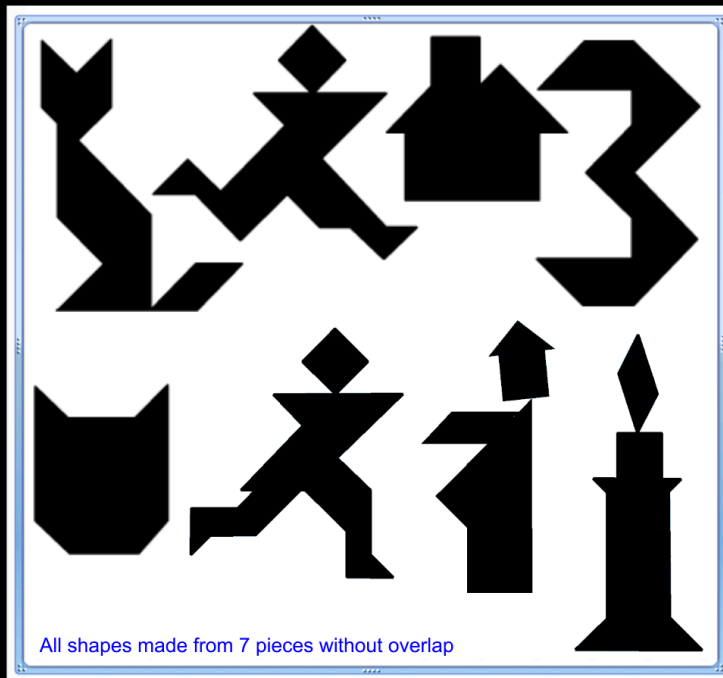
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Tangram Examples 1



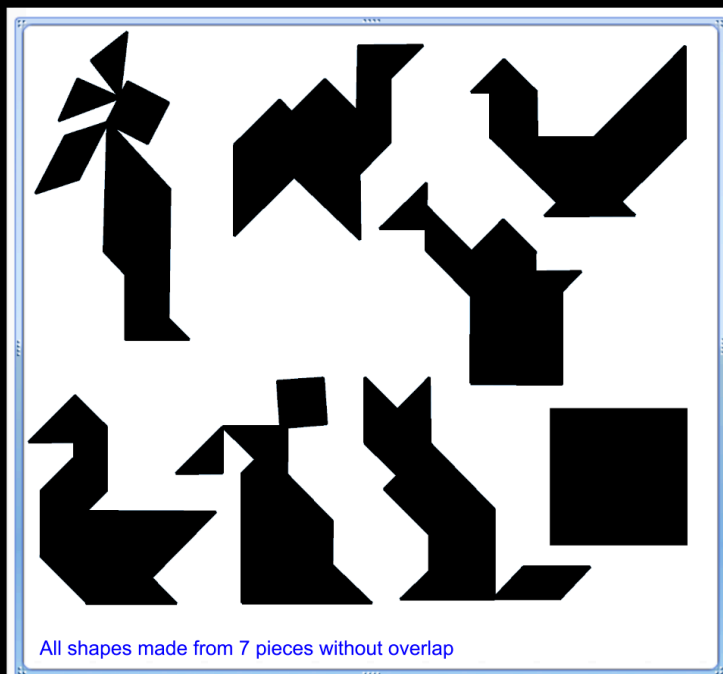
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Tangram Examples 2



Our Maths APPs

Spire Maths

MathsTube for
maths videos

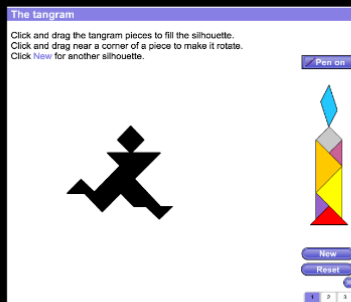
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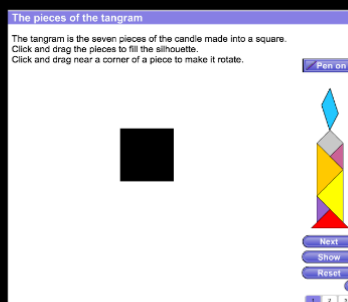
Tangram More: Spiremaths Interactives

<https://spiremaths.co.uk/ia/?target=Problems>

Problems 3



Problems 3r

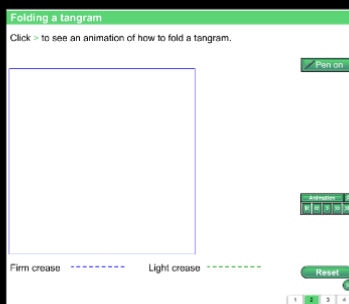
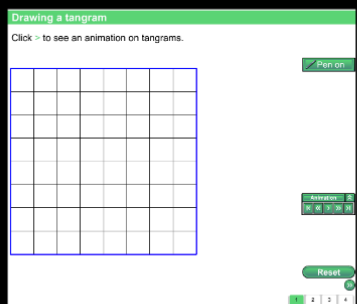


If you use Chrome as your browser then these interactive files might not work (you are instead asked if you want to Keep or Discard the files, say Discard and go to the link below and follow the instructions to enable the relevant plugin. Mac and Windows instructions are both there: scroll down. You only have to do this once.

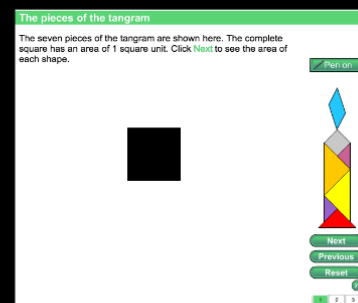
You will need relevant permission to do this on the computer.

<https://helpx.adobe.com/flash-player/kb/enabling-flash-player-chrome.html>

Problems 4



Problems 4r

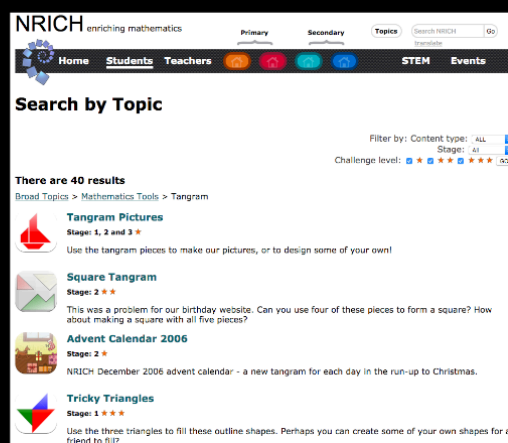


Tangram More

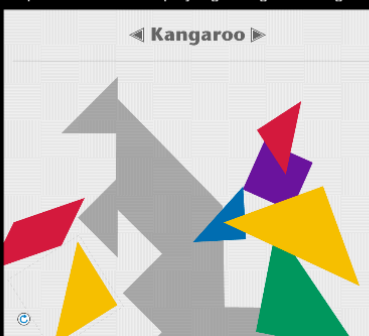
<http://illuminations.nctm.org/Activity.aspx?id=6384>



<http://nrich.maths.org/public/leg.php?code=5044>



<http://www.museumofplay.org/web-games/tangrams/>



<http://www.cleavebooks.co.uk/trol/trolxk.pdf>



Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All

Interactive Web Resources(IWB slides 9 and 10 and page above)

Spire Maths

<https://spiremaths.co.uk/ia/?target=Problems> (our interactive pages)

There is a tangram animation that uses squared paper and a folded version (The pieces of the tangram file). Extensive notes too. Some other interesting problems are also found on this page.

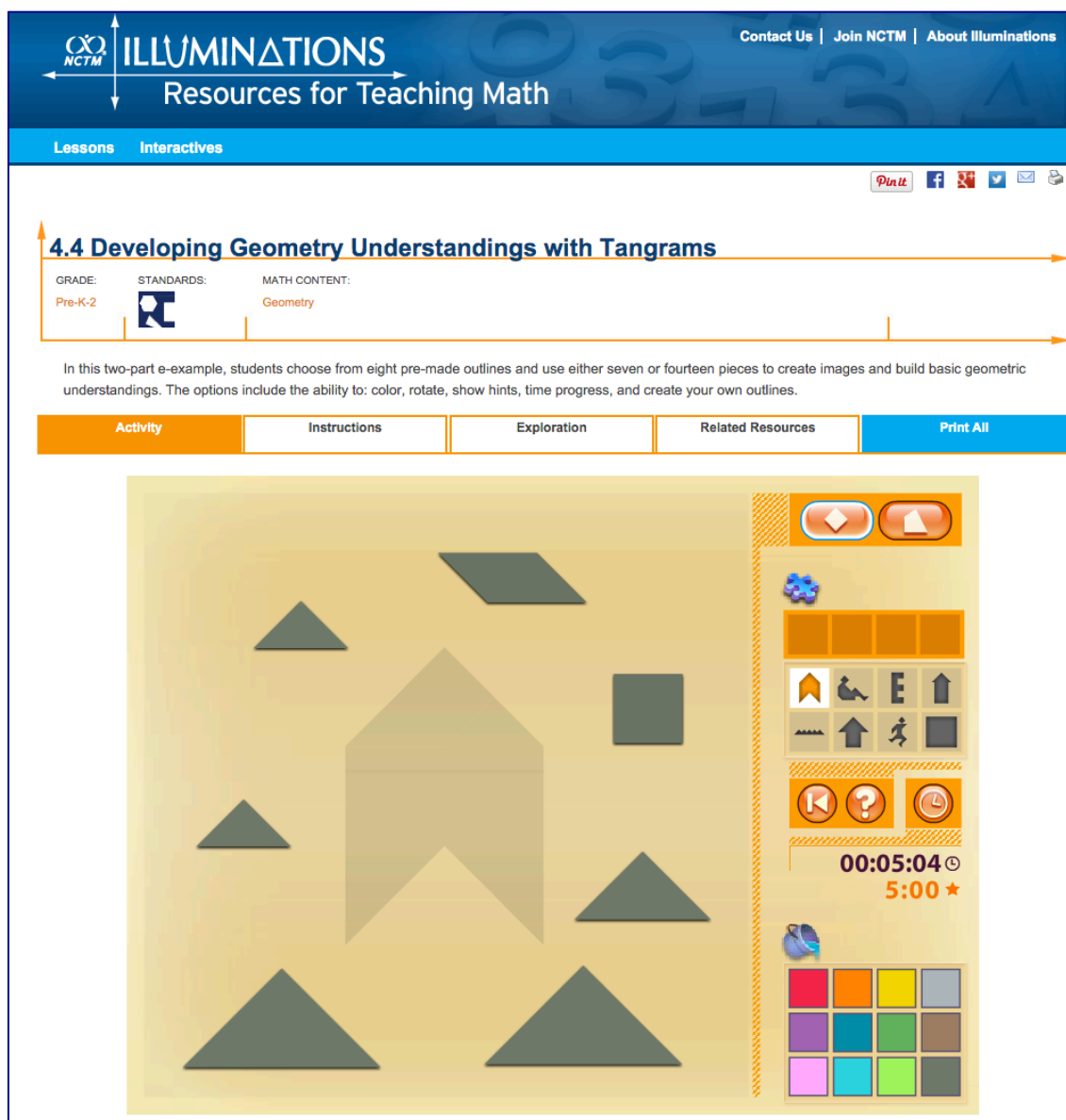
Illuminations (Good US maths site with Manipulatives)

<http://illuminations.nctm.org/Activity.aspx?id=6384> (diagram below).

In this two-part e-example, students choose from eight pre-made outlines and use either seven or fourteen pieces to create images and build basic geometric understandings. The options include the ability to: colour, rotate, show hints, time progress, and create your own outlines.

This page below comes from a resource called Puzzling Relationships which has further ideas.

<http://www.nctm.org/Classroom-Resources/Lessons/Puzzling-Relationships/>

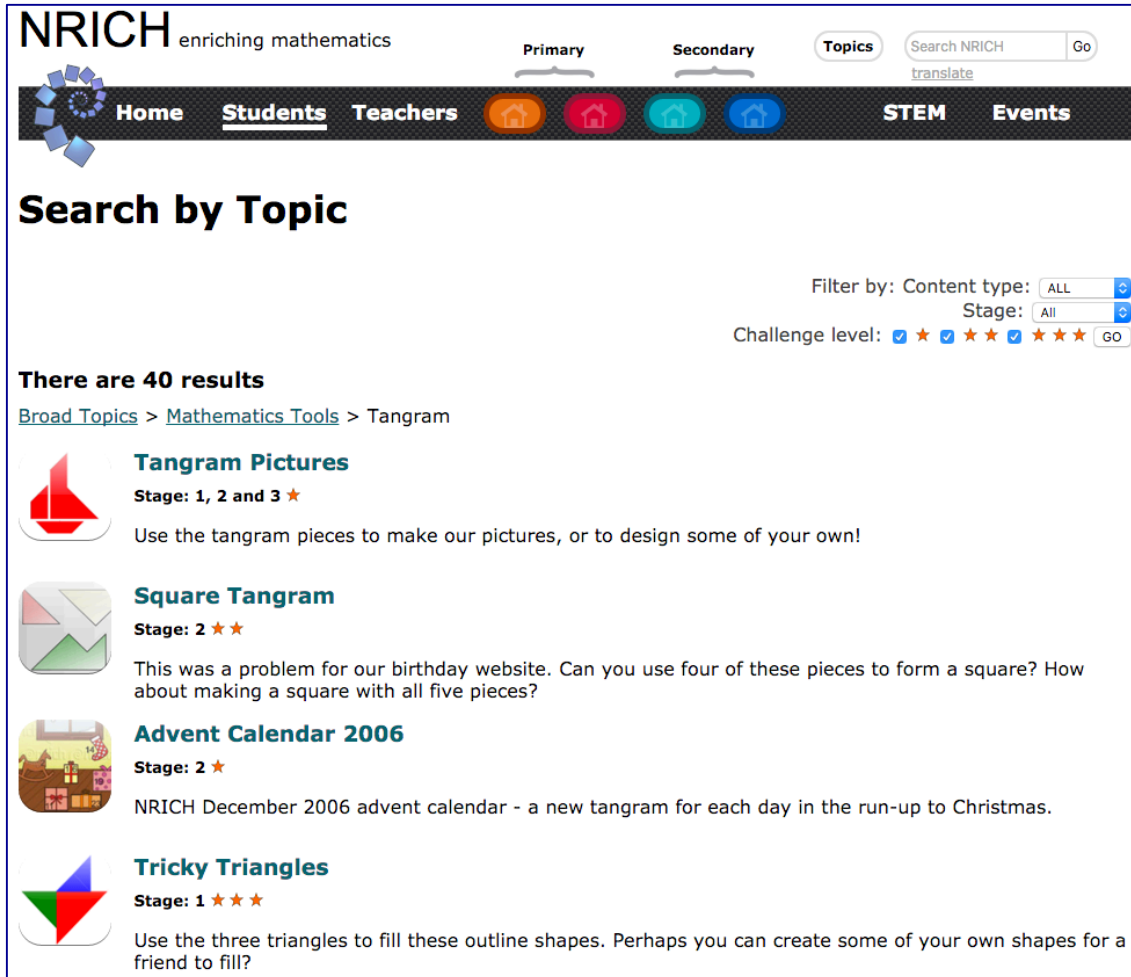


The screenshot shows the Illuminations website interface. At the top, there's a blue header with the 'ILLUMINATIONS' logo and navigation links like 'Contact Us', 'Join NCTM', and 'About Illuminations'. Below the header, there's a blue bar with 'Lessons' and 'Interactives' tabs. The main content area is titled '4.4 Developing Geometry Understandings with Tangrams'. It includes a sidebar with 'GRADE: Pre-K-2', 'STANDARDS: Geometry', and 'MATH CONTENT: Geometry'. Below this, there's a description of the activity: 'In this two-part e-example, students choose from eight pre-made outlines and use either seven or fourteen pieces to create images and build basic geometric understandings. The options include the ability to: color, rotate, show hints, time progress, and create your own outlines.' A navigation bar at the bottom of the activity section includes 'Activity', 'Instructions', 'Exploration', 'Related Resources', and 'Print All'. The main workspace shows a large yellow square with several grey tangram pieces (triangles, squares, and a parallelogram) arranged to form a central shape. To the right of the workspace is a control panel with buttons for rotating, coloring, and other functions, along with a timer showing '00:05:04' and a star icon.

Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All
Nrich (Excellent UK site – for all maths activities)

Forty tangram related activities with their usual teacher support etc.

<http://nrich.maths.org/public/leg.php?code=5044>



The screenshot shows the NRICH website interface. At the top, the NRICH logo is followed by the tagline 'enriching mathematics'. Navigation links for 'Primary' and 'Secondary' are present, along with a 'Topics' button and a search bar. The main navigation bar includes 'Home', 'Students', 'Teachers', and 'STEM Events'. The 'Search by Topic' section is active, displaying filters for 'Content type' (ALL), 'Stage' (All), and 'Challenge level' (a row of star icons). Below the filters, it states 'There are 40 results' and shows the breadcrumb path 'Broad Topics > Mathematics Tools > Tangram'. Four activity cards are listed: 'Tangram Pictures' (Stage: 1, 2 and 3), 'Square Tangram' (Stage: 2), 'Advent Calendar 2006' (Stage: 2), and 'Tricky Triangles' (Stage: 1). Each card includes a small image and a brief description of the activity.

NRICH enriching mathematics

Primary Secondary Topics Search NRICH Go translate

Home Students Teachers STEM Events

Search by Topic

Filter by: Content type: ALL Stage: All Challenge level: GO

There are 40 results

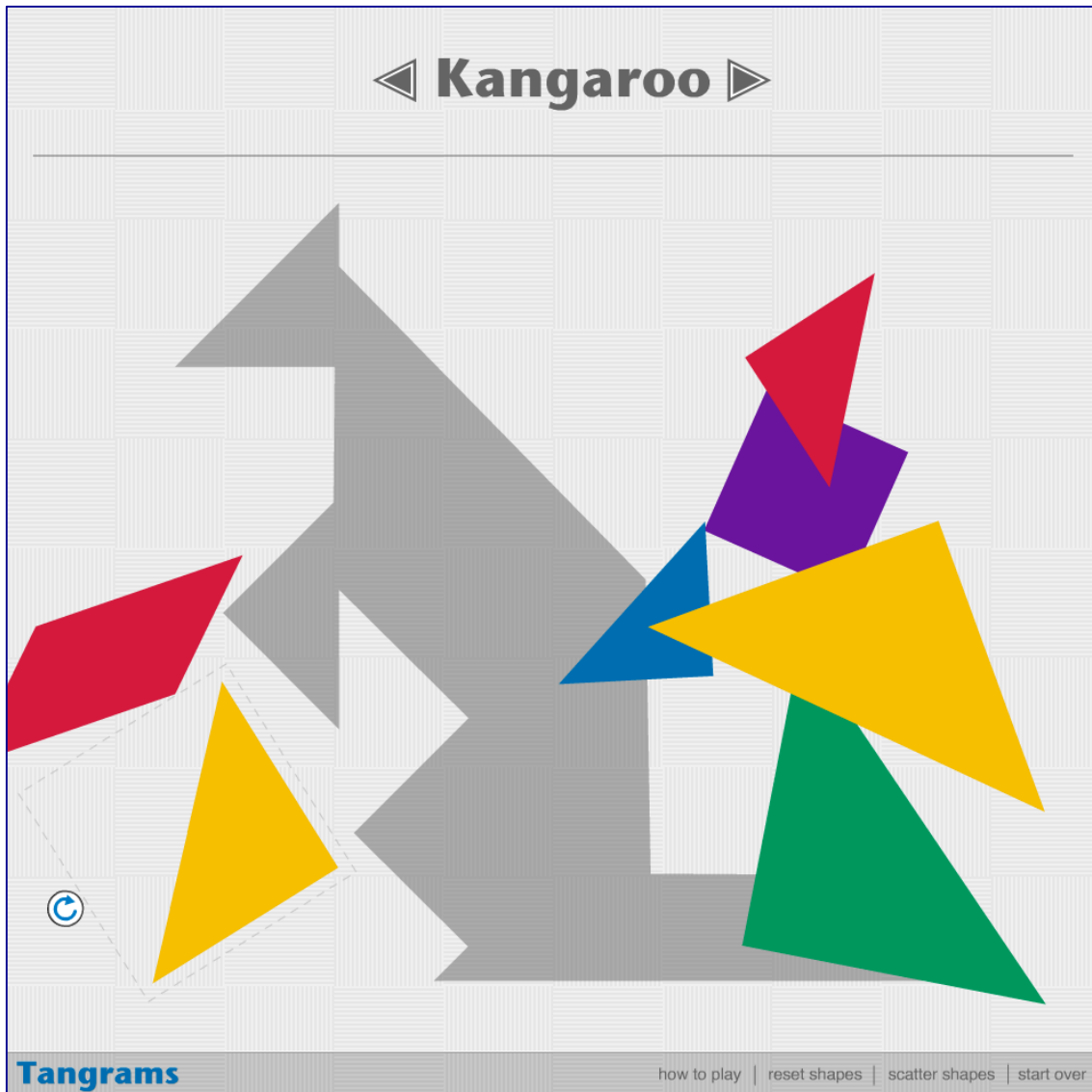
[Broad Topics](#) > [Mathematics Tools](#) > Tangram

- Tangram Pictures**
Stage: 1, 2 and 3 ★
Use the tangram pieces to make our pictures, or to design some of your own!
- Square Tangram**
Stage: 2 ★ ★
This was a problem for our birthday website. Can you use four of these pieces to form a square? How about making a square with all five pieces?
- Advent Calendar 2006**
Stage: 2 ★
NRICH December 2006 advent calendar - a new tangram for each day in the run-up to Christmas.
- Tricky Triangles**
Stage: 1 ★ ★ ★
Use the three triangles to fill these outline shapes. Perhaps you can create some of your own shapes for a friend to fill?

Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All
Museum of Play

New site to me, but this seems a good activity.

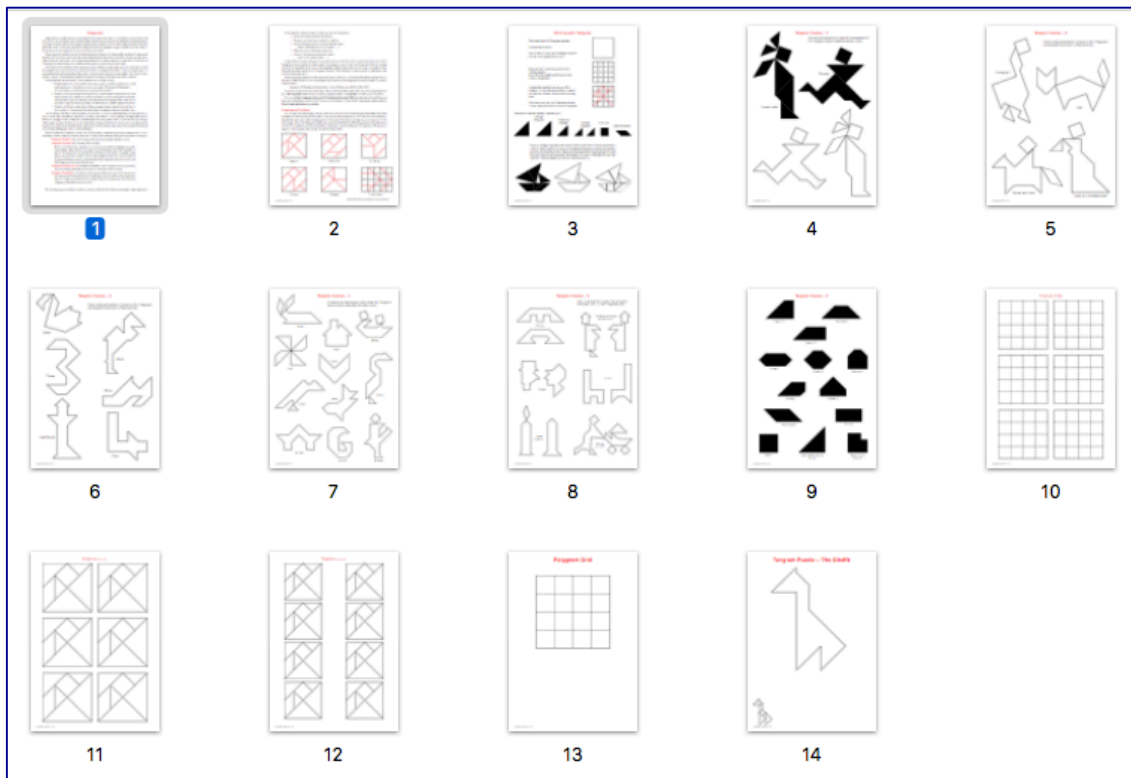
<http://www.museumofplay.org/web-games/tangrams/>



Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All Teacher Resources on Line (TROL)

There are many booklets and templates on this site. Often linked to from CIMT. Have plenty of good mathematics background.

<http://www.cleavebooks.co.uk/trol/trolxk.pdf>



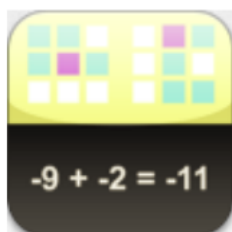
Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All

Our iPad and iPhone resources

Search for Jamtec on the AppStore. We also have other non-mathematics apps. Prices correct at 5 March 2017.



Age-ulator Free: Randomised £0.99



Directed Numbers £0.99: Equivalents £0.99: Multiplication Pairs £0.99



Maths Charts for Jenny Eather Free:
Maths Charts for Jenny Eather (Deluxe version) £4.99



GeoDraw £0.99 (iPad only)

Education APPs from Apple

Half price for volume purchase of some Education APPs

All non-free APPs above are eligible for this discount.

AdBlocker software for browsers

Many mathematics sites unfortunately have adverts: we really like the AdBlocker software which we download from Softonic at: <http://bit.ly/adblockmw>

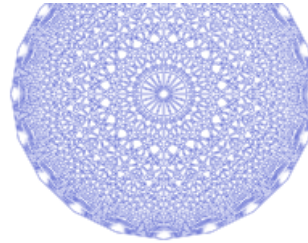
Stimulating, Practical, Interesting, Relevant, Enjoyable Maths For All

Maths APPs for iPads and iPhones

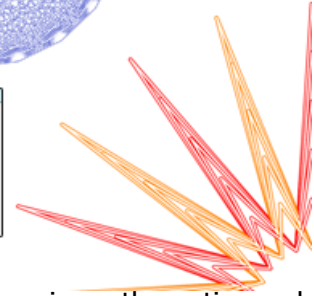
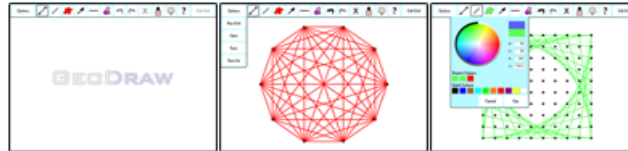


GEO DRAW

Available on iPad iOS 5.0 or (iPad only)



£0.99

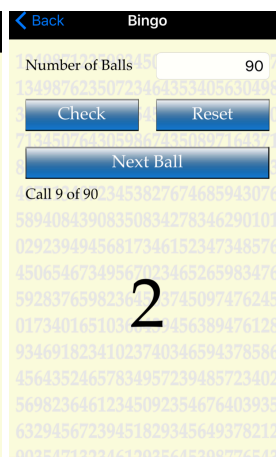
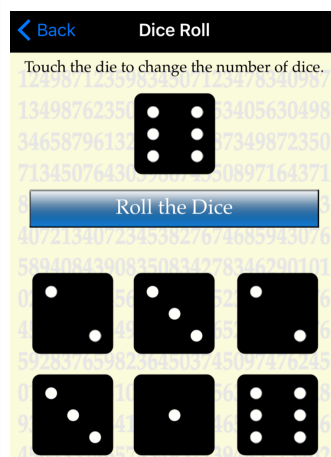
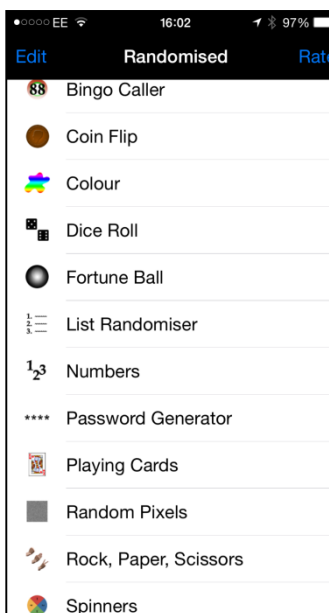
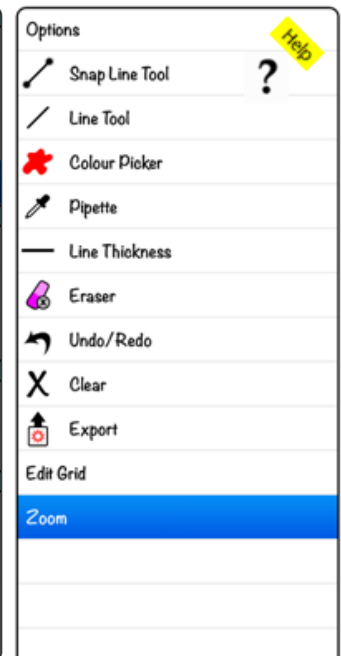
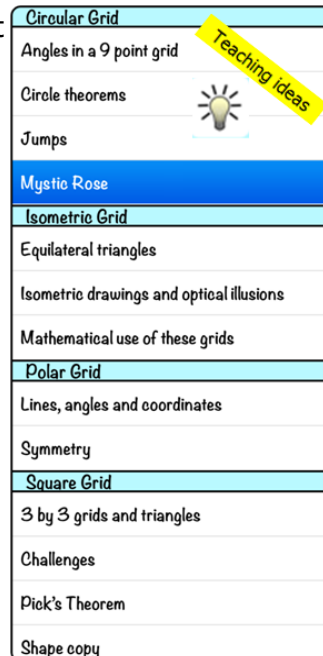
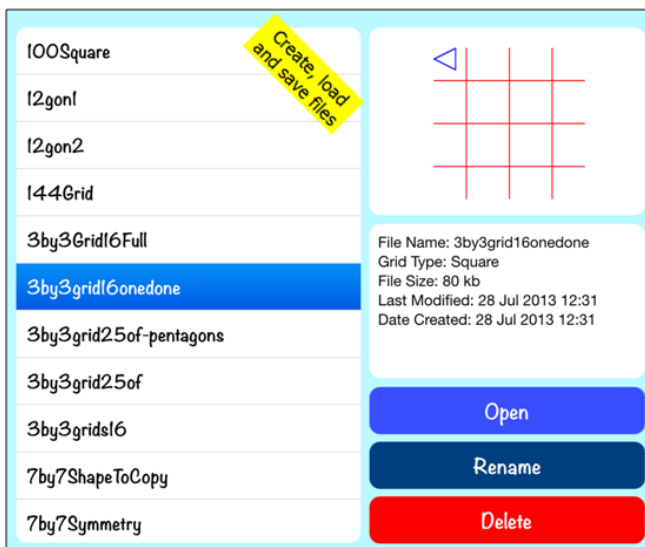


Change

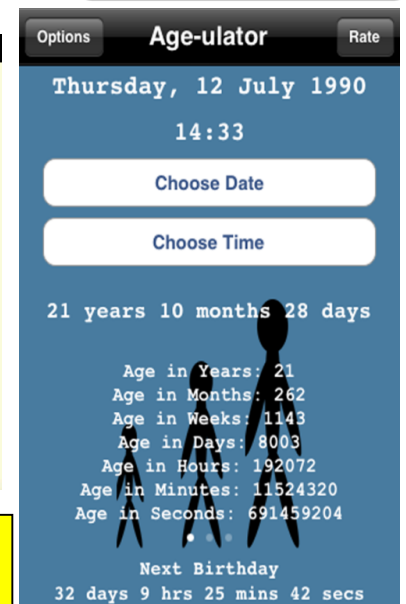
Number of grid points
Grid point size
Line thickness
Line colour

- GeoDraw offers users a choice of 5 grids for use in mathematics and D&T lessons. Send/export images with/without grid using: Bluetooth, Email, Facebook, Twitter and into Pages or Keynote.

Eligible for VPP discount
(see next page).



Randomised (99p): for probability lessons.
Age-ulator (free): for large number work and problem solving.



We've teamed up with Jenny Eather to bring her Maths Charts web resources to the iPad/iPhone. Try Maths Charts by Jenny Eather for free, then buy full Deluxe version for £4.99 (half this if you sign up for VPP with Apple and buy 20 or more copies).

Decimals

Ordering decimals

Expanding decimals

Adding decimals

Subtracting decimals

Multiplying decimals

Dividing decimals

Rounding decimals

Decimals, percentages, fractions

Decimals, percentages, fractions

Decimals, percentages, fractions

Triangles

A triangle is a polygon with three sides and three angles. The total of the angles in any triangle is 180°.

An equilateral triangle has 3 equal sides and 3 equal angles of 60°.

Types of triangles

scalene triangles

- no equal sides or equal angles

isosceles triangles

- 2 equal sides and 2 equal angles

equilateral triangles

- 3 equal sides and 3 equal angles (more than 90°)

obtuse triangles

- one obtuse angle (less than 90°)

acute triangles

- three acute angles (less than 90°)

right-angled triangles

- one right angle (90°)

Area of a triangle

Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height}$

Maths Charts

24-hour time

24-hour clocks

Hours Minutes Seconds

Area - metric units

The square metre is the base unit of area in the International metric system.

Symbol: m²

The most commonly used units are:

square centimetre (cm²) square metre (m²)

hectare (ha) square kilometre (km²)

1 square metre = 10 000 square centimetres

1 square kilometre = 100 hectares

Examples:

The face of a book is 1 square centimetre.

A 1 metre ruler has a top that is 1 square metre.

The carpet area has an area of 1 square metre.

A 1 metre ruler has a top that is 1 square metre.

Australia has an area of 2 800 000 square kilometres.

Welcome!

Over 250 printable Maths Charts or maths posters suitable for interactive whiteboards, classroom displays, maths walls, display boards, student handouts, homework help, concept introduction and consolidation and other maths reference needs.

$\frac{3}{8}$
 $\frac{4}{5}$
 $\frac{5}{8}$
 $\frac{16}{36}$
 $\frac{24}{30}$
 $\frac{35}{63}$

$\frac{1}{9}$
 $\frac{4}{9}$
 $\frac{5}{9}$
 $\frac{27}{36}$
 $\frac{8}{72}$
 $\frac{21}{56}$

$\frac{3}{21}$
 $\frac{24}{24}$

7	x	1	=	Show
7	x	2	=	Show
7	x	3	=	Show
7	x	4	=	Show
7	x	5	=	Show
7	x	6	=	Show
7	x	7	=	Show
7	x	8	=	Show
7	x	9	=	Show
7	x	10	=	Show
7	x	11	=	Show
7	x	12	=	Show

Change format Show All

2 3 4 5 6 7

DIRECTED NUMBER

MATHS

Addition and Subtraction

Multiplication and Division

Mixed Questions

Substitution in Expressions

$64 \div 8$	$72 \div 12$	$48 \div 8$	9	6	5
$40 \div 8$	$70 \div 7$	$20 \div 4$	10	9	5
$72 \div 8$	$21 \div 3$	$81 \div 9$	8	6	7