DYNAMIC INTERACTIVE GEOMETRY

CABRI GEOMETRY II plus

AS SPECIFIED FOR KS3

The KS3 specification strongly recommends the use of ***dynamic geometry*** software - and illustrates its use throughout. It's also a powerful tool at primary, KS4, college and university levels.

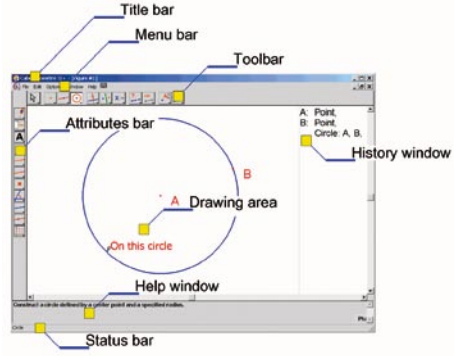
With Cabri Geometry II Plus you can dynamically explore Euclidean, transformational & coordinate geometry. Draw vectors and conics (incl. ellipses and hyperbolas). See equations of basic geometric objects (e.g. lines, circles, ellipses) and the coordinates of points.

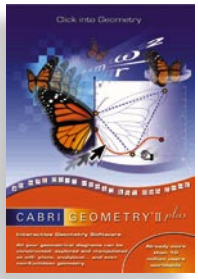
Freely manipulate the figure, test its construction, issue conjectures, measure, calculate, delete, modify or undo what has been done. Invariant properties are revealed through translation, dilation and rotation on screen. It brings geometry to life allowing new approaches.

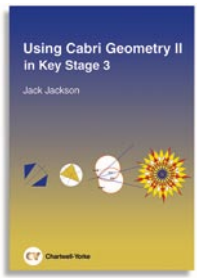
Easy to learn. Easy to use

Cabri handles all the constructions students have traditionally done with ruler, pencil, compass and protractor, and goes much further. Lines, circles, points, triangles, vectors, conics, etc are easily created, manipulated and measured with toolbars and drop-down menus. Alter geometric figures on the screen, to explore generalities.

Students can see patterns, make conjectures, draw their own conclusions, and create alternative examples of the construction. Integrate images into word processing documents or distribute them via the internet in CabriJava format.

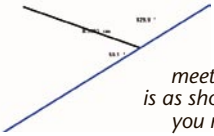




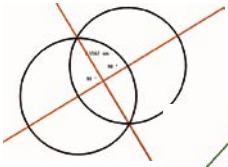


Cover all the dynamic geometry activities in Key Stage 3, and more

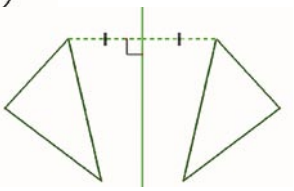
Explore the shortest distance between a point and a line. First we need to draw two lines, then measure the length and angles between them.



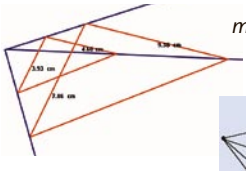
Now move the point where the line segment meets the line until its length is as short as possible. What do you notice about the angles?



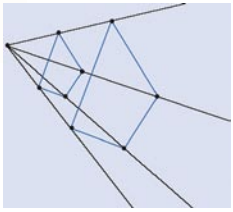
Now find the position of the point on the line in a different way.



What happens to triangles when they are reflected in a straight line?

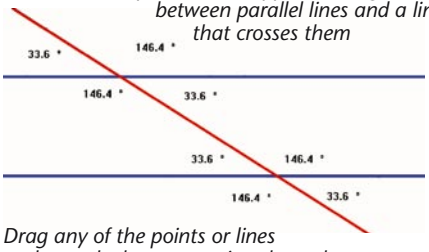


What happens to measurements when we enlarge triangles?



Explore transformations, (enlargement, rotation, reflection, translation) and symmetry with Cabri

Explore what happens to angles between parallel lines and a line that crosses them



Drag any of the points or lines and record what you notice about the angles as the lines move

eVALUATE REVIEW

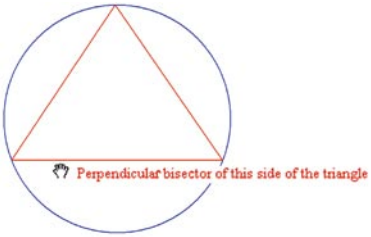
"This dynamic, flexible resource can be used to teach geometry to KS3 and KS4 students of all abilities."

SCHOOLZONE REVIEW

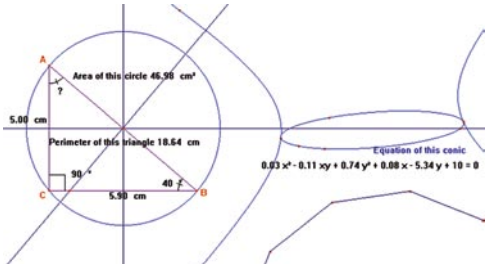
"It enables you to do anything in the field of Geometry that in the past you might have done on paper, but it enables you to do the same and a lot extra in a more efficient, more accurate and a more exciting manner."

TEEM REVIEW

"The key feature of this software tool is that it enables learning through exploration, which makes it a desirable addition to any maths department's armoury."



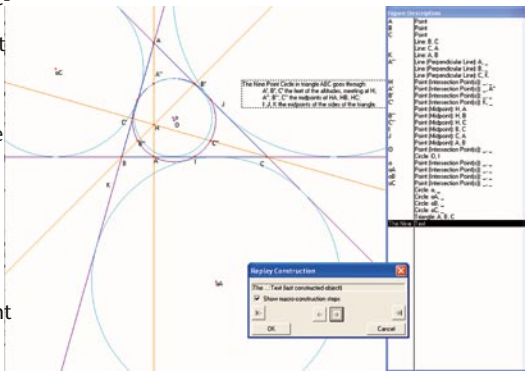
[Above:] Cabri gives clear textual feedback to indicate which object you are working with. In doing so it trains the user to use correct geometrical vocabulary.



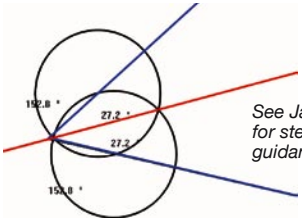
[Above:] Cabri shows measurements and equations of objects to however many decimal places you prefer.

[Right:] A formal description of the construction is given in the "Option/Show Figure Description" window. Highlight an element and the corresponding part of the formal description is highlighted. Cabri offers an automatically generated textual summary of each stage of the construction, which can be printed as a report.

Cabri lets you replay a construction to see the sequence of actions taken. Use familiar transport controls like a tape recorder to step forwards or backwards throughout a construction. Clearly this helps teachers to see exactly which steps an individual student has taken, and to subsequently go through discussing each step with the student.



Explore ways of dividing an angle into two



See Jackson book for step by step guidance

Drag the points you created around. What do you notice about the angles as the image moves?

Cabri is flexible ...

- Teachers can customise menus to display only relevant tools
- Add macros to any menu to automate steps
- Redefine points or objects

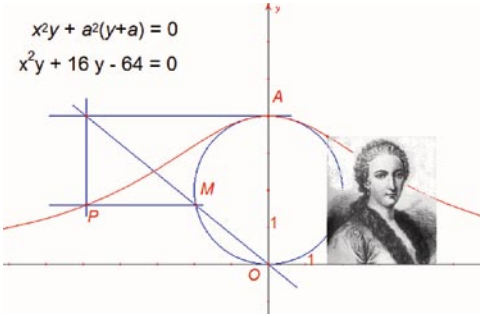
and very powerful ...

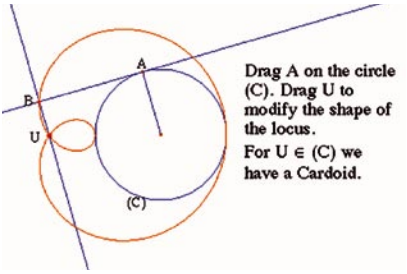
- Display loci of points or objects, loci of loci, and intersections with loci !
- Create objects involving elements at infinity
- Equation tool can obtain the equation of a locus for algebraic curves !

.../Continued

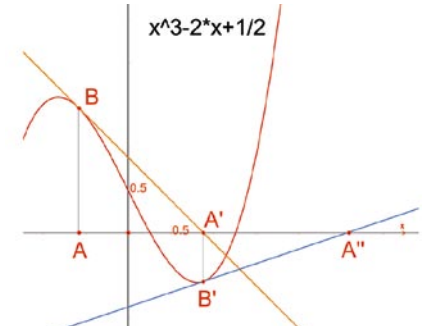
The new "Smart Lines" technology helps clarity by displaying only the necessary portions of lines if you wish, to avoid on-screen clutter. This is not only neater, but helps concentration on the essential elements and avoids otherwise distracting unwanted extrusions. Alternatively, lines and objects can be hidden from view.

The arrow heads at the ends of the visible portion of smart lines indicate their mathematical continuance. They are Smart because they intelligently adapt to the needs of the construction. If smart lines are moved so that an intersection occurs, then they will extend to reveal that intersection, for example. Only the necessary portions are shown.

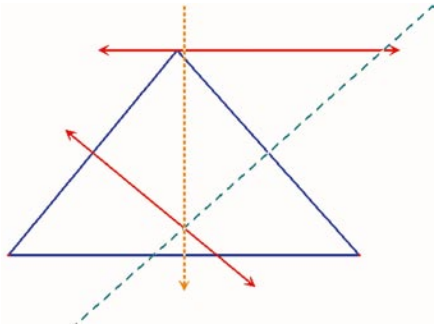




[Below:] Graph a function as a geometrical locus of points! Cabri can give an algebraic equation of the locus, and does it dynamically!



Cabri's 'Smart Lines' technology



The Witch of Agnesi

Fermat, and then Italian mathematician Agnesi, have studied the curve obtained from circle OA as shown on the left.

In this drawing smart lines are used to focus the reader's attention on the important aspects. Finally, the Witch of Agnesi is obtained as a locus of point P when M is moving on the circle.

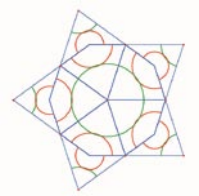
Also shown here is Cabri's ability to attach an image to a point. Attached images not only follow the point to which they are attached, but can transform appropriately.

[Top left:] Cabri's equation feature can be applied to the locus and give an equation with integral parameters, here 16 and 64, matching the value 4 of the diameter of the circle. Varying the point A with integer steps, one can easily infer the general symbolic formula (see top left illustration) for the equation of the Witch of Agnesi.

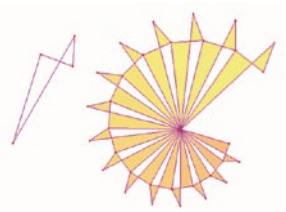
- Watch the free training videos on how to use Cabri on our website.
- Download the free trial and articles on how to use Cabri.
- Choose an appropriate licence from the options below.

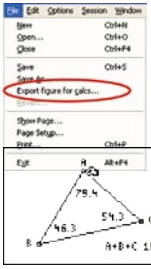
Cabri System Requirements: Windows Version (95, 98, ME, 2000, XP, NT) 16mb RAM. Free demo and resources on website or CD-ROM. Macintosh Version OX 9, OS X 10.3.5 or higher.

Licences and Prices: Cabri Single User £59 + vat, 10 Users £175 + vat, 50 Users £350 + vat, Site Licence £420 + vat. Upgrades available. (Student licences available to Site Licence holders only, £21 + vat.)



[Right:] Transform the spiral by manipulating parameters of the construction to its left





[Above:] Create tesselating planes *[Below left:]* Export to TI Calculators

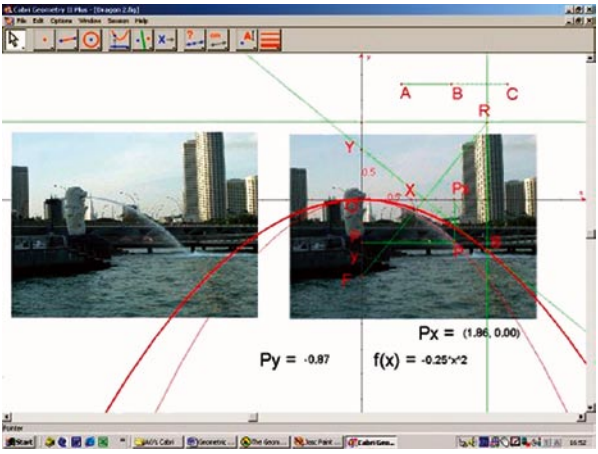
Cabri is user-centred. It is based on carefully-designed metaphors that take into account the habits of human users. The sequence of tool and object selection in Cabri is the same as in real life. We first select the tool and then the object to which it shall be applied. We choose a pen and apply it to paper, we choose a spanner and apply it to a nut. In Cabri we choose the tool and apply it to the geometrical element. The sequence is also natural to an English speaker grammatically. In Cabri you choose the measurement tool first and then the object to measure, for example. So, you choose the attribute then the object. English grammar is the same; we say 'red circle' for example. In Cabri, we select red as a colour then apply it to the circle.

Create Geometric & Algebraic Models with Cabri Geometry II Plus

Here, using Cabri Geometry II Plus, Adrian Oldknow illustrates an approach to algebraic modelling applied to a digital photograph of the fountain in Singapore harbour.

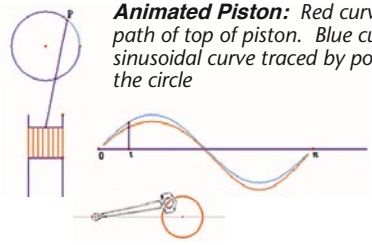
Import a picture by right-clicking the mouse anywhere on the background and selecting Background Image, and the From File – which allows you to import an image file such a JPEG. You can also define a point with the Point tool and right-click on it to import an image which is draggable around the screen

Cabri II Plus lets you perform calculations on measurements and to use such results to plot the coordinates of a point on specified axes. The parabola above is plotted as the locus of *P* with *Px*.



Cabri's background images and images attached to points bring your geometry to life and allow more realistic modelling. With Cabri you can use compact JPEGs from your digital camera. Also, these graphics can be transformed with intermediate pictures showing. Cabri pictures can be resized dynamically.

Animate dynamic models



Animated Piston: *Red curve is path of top of piston. Blue curve is sinusoidal curve traced by point on the circle*

Tracing the locus of a point on the wheel

Cabri II Plus offers superb animation facilities and colour possibilities amongst its many improvements (see website).

SUPPORT MATERIALS FOR CABRI OVERLEAF >>

Buy the CD-ROMs and Book to help you use Cabri Effectively

Exploring Geometry with Cabri II Plus

Lessons, Activities and Demonstration files for 11-14 Geometry

This collection of Cabri files on CD-ROM includes a printable PDF book of lessons, activities and answers. It is easily incorporated into existing schemes of work and immediately engage pupils with the mathematics so a minimum amount of time is spent teaching on learning Cabri. There are 3 main categories of files.

A) Lesson files These have been designed with specific lessons in mind, and come with a detailed lesson plan and support materials. However, they also work stand alone and can be used by pupils as part of an existing lesson or by the teacher as part of a demonstration.

B) Activity files These are stand alone files which have specific learning objectives in mind and may be used as part of an existing series of lessons. They usually contain a question and encourage pupils to investigate and record their findings.

C) Demonstration files These are primarily created for teachers to use as part of an introduction with interactive whiteboards but may also be used by pupils.

In addition there are printed worksheets that are linked to some of the activities and which ensure that skills which have been gained on the computer are transferable to pencil and paper. There is also an appendix of useful tips that will make the lessons easier to manage.

Finally there is a small number of open questions to get pupils exploring independently and an index of the files and folders on the CD-ROM.

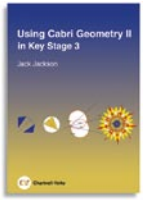
Section A: Lessons Defining Quadrilaterals; Area of a Parallelogram; Area of a Trapezium; Areas of Plane Shapes; Circumference of a Circle; Area of a Circle; Creating an Islamic-style Design; Rotational Symmetry; Order of Rotational Symmetry; External Angles of Polygons; Internal Angles of Polygons; Multiplication of Negative Numbers; Wheels 1; Wheels 2; Variables; Construction.

Section B: Activity files Reflection 1, 1a, 2, 2a, 3, 3a; Rotation 1, 1a, 2, 2a; y=mx+c; Find the equation; Find the equation 2.

Section C: Whiteboard Demonstration Files Enlargement; Negative enlargement; Enlargement with grid; Area of a Rectangle; Right-angle Triangle Area; Pythagoras 1, 2; Pythagoras Proof; Construction; Construction answers; y=mx+c; Gradient Intercept; Expanding Brackets; Grid Multiplication; Quadratic Multiplication.

Worksheets Parallelograms to Rectangles 1, 2; Area of a Trapezium 1, 2, 1b, 2b; Areas of Plane Shapes; Circumference; Area of a Circle; Islamic Design; Pentomino Reflection 1, 1a, 2, 2a; Order of Rotational Symmetry; Pentomino Rotation 1; External Angles Worksheet; Internal Angles Worksheet; Negative Number Tables; Wheels 1, 2; Variables 1, 2; Find the Equation.

Using Cabri Printing, Number Edit; Deleting Instructions; Changing Patterns; Choosing Points; Colouring; What Next? Cabri Geometry II Files on the CD. Answers. **£39 + vat** including site licence for lessons, activities and demonstration files.



Using Cabri Geometry II in Key Stage 3 Jack Jackson

Photocopiable dynamic geometry activities from the KS3 Framework. Systematic instructions to set up a robust screen that will demonstrate particular geometrical properties. Investigations leading students to discover geometrical properties for themselves. Helps to make the first steps towards developing geometrical proof.

Contents: Geometrical reasoning (lines, angles and shapes); Geometrical reasoning (properties of circles); Transformations; Construction and loci; Cabri activities mapped to objectives from the Key Stage 3 Framework.
ISBN 1-904506-00-3, 48 pages, Photocopiable. £20.

Developed for the ATM by Dave Hewitt, Kate Mackrell, Dave Wilson, David Rooke, David Wooldridge, and Derek Ball

Active Geometry

- **17 files** for use with the dynamic geometry programs Cabri-Geometry II and Geometer's Sketchpad.
- **Over 100 student activities worksheets** based on the files. In electronic form so you can change or adapt them to suit your needs before printing and photocopying for class use. The files and activities address the following topics.
  Shape: triangles and quadrilaterals;
  Area: triangles, quadrilaterals, parallelograms, rectangles, circles;
  Perimeter: triangles, quadrilaterals,
  Transformations: reflection, rotation.
  Equations & gradients of straight lines
  Names and properties of quadrilaterals

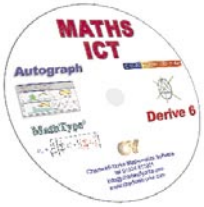
Can be used with a whole class focus with just one computer in the classroom, or for students working individually or in small groups. Windows & Mac versions are supplied.

£29 + vat including photocopying rights & Site Licence for activity files.

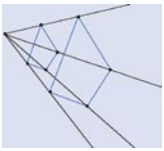
How to Order

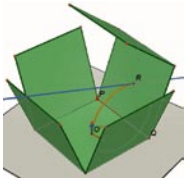
Orders and enquiries welcomed at the address below either by phone, email, post, fax, or online. Despatch normally same day! Delivery is FREE within the UK. Overseas delivery quotes by post of courier speedily available.

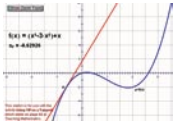
Please obtain an official Purchase Order number if your institution requires you to do so. We are happy to supply educational institutions with goods together with a 30-day invoice. Personal and overseas customers should send payment with order. Cheques should be payable to "Chartwell-Yorke Ltd." Visa, Mastercard, Solo, Maestro or American Express cards are welcomed.

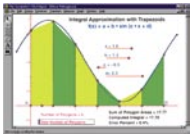


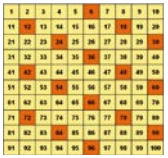
Free Trial CD-ROM available to teachers

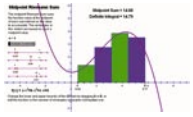


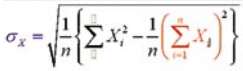


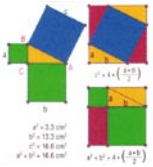


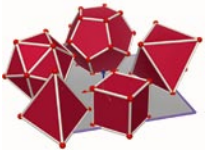












Autograph version 3

CABRI GEOMETRY II plus

CABRI 3D

Derive 6

Developing Number 2

Fathom

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THE GEOMETER'S SKETCHPAD

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TinkerPlots

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