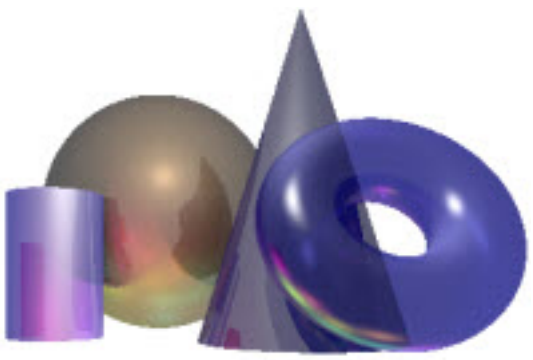
Geometry

Geometry is all about **shapes** and their properties.

If you like playing with objects, or like drawing, then geometry is for you!

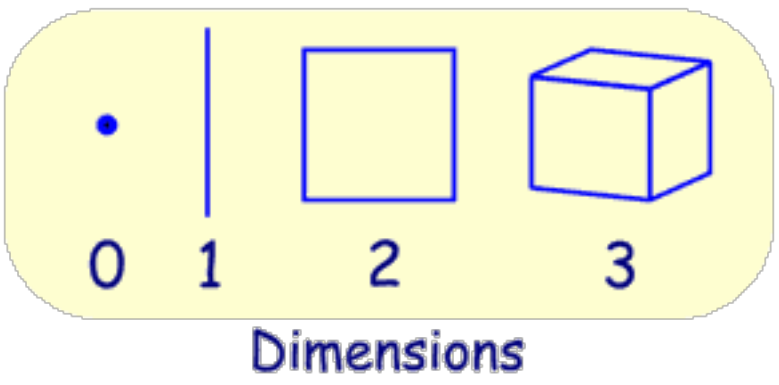
Geometry can be divided into:

Plane Geometry is about flat shapes like lines, circles and triangles ... shapes that can be drawn on a piece of paper



Solid Geometry is about three dimensional objects like cubes, prisms, cylinders and spheres.

Hint: Try drawing some of the shapes and angles as you learn ... it helps.



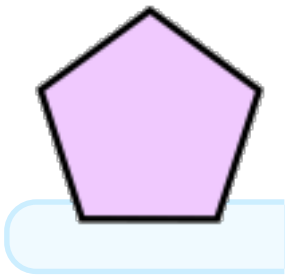
Point, Line, Plane and Solid

A Point has no dimensions, only position
A Line is one-dimensional
A Plane is two dimensional (2D)
A Solid is three-dimensional (3D)

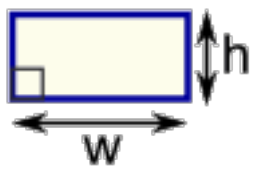
Plane Geometry

Plane Geometry is all about shapes on a flat surface (like on an endless piece of paper).

- 2D Shapes
- Activity: Sorting Shapes
- Triangles
- Right Angled Triangles
- Interactive Triangles



- Quadrilaterals (Rhombus, Parallelogram, etc)
- Rectangle , Rhombus , Square , Parallelogram , Trapezoid and Kite
- Interactive Quadrilaterals
- Shapes Freeplay



- Perimeter

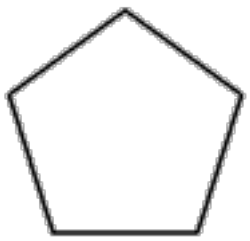
- Area
- Area of Plane Shapes
- Area Calculation Tool
- Area of Polygon by Drawing
- Activity: Garden Area

- General Drawing Tool

Polygons

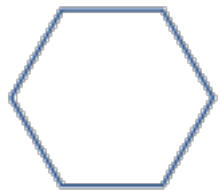
A Polygon is a 2-dimensional shape made of straight lines. Triangles and Rectangles are polygons.

Here are some more:



Pentagon

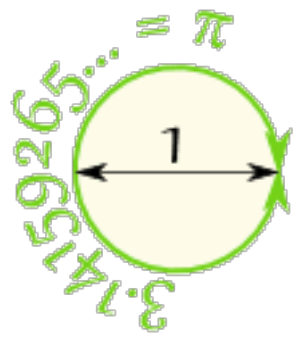
Pentagram



Hexagon

- Properties of Regular Polygons
- Diagonals of Polygons
- Interactive Polygons

The Circle



- Circle
- Pi
- Circle Sector and Segment
- Circle Area by Sectors
- Annulus
- Activity: Dropping a Coin onto a Grid

Circle Theorems (Advanced Topic)

Symbols

There are many special symbols used in Geometry. Here is a short reference for you:

Geometric Symbols

Congruent and Similar

- Congruent Shapes

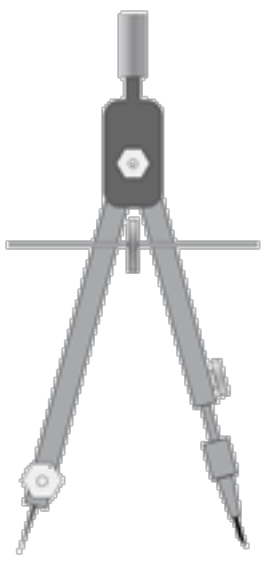
- Similar Shapes

Angles

Types of Angles

Acute Angles	Right Angles	Obtuse Angles	Straight Angle	Reflex Angles	Full Rotation

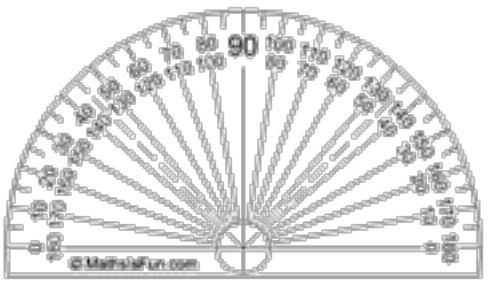
- Degrees (Angle)
- Radians
- Congruent Angles
- Parallel Lines and Pairs of Angles
- Transversal
- A Triangle Has 180°
- Supplementary Angles
- Complementary Angles
- Angles Around a Point
- Angles on a Straight Line
- Interior Angles
- Exterior Angles
- Interior Angles of Polygons
- Exterior Angles of Polygons



Using Drafting Tools

- Geometric Constructions
- Using the Protractor
- Using the Drafting Triangle and Ruler

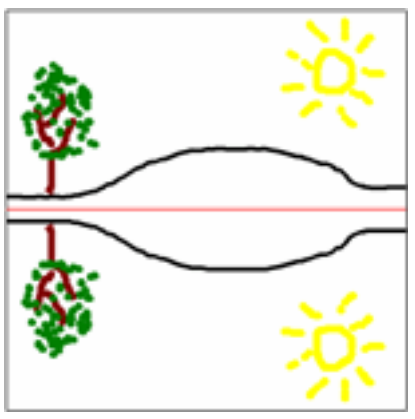
- Using a Ruler and Compass



Transformations and Symmetry

Transformations:

- Rotation
- Reflection
- Translation
- Resizing



Symmetry:

- Reflection Symmetry
- Rotational Symmetry
- Point Symmetry
- Lines of Symmetry of Plane Shapes

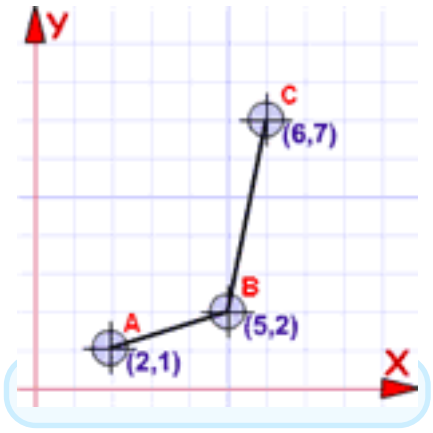
- Symmetry Artist

- Activity: Symmetry of Shapes
- Activity: Make a Mandala

- Activity: Coloring (The Four Color Theorem)

- Tessellations
- Tessellation Artist

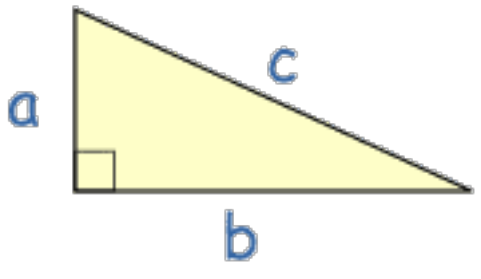
Coordinates



- Cartesian Coordinates
- Interactive Cartesian Coordinates
- Hit the Coordinate Game

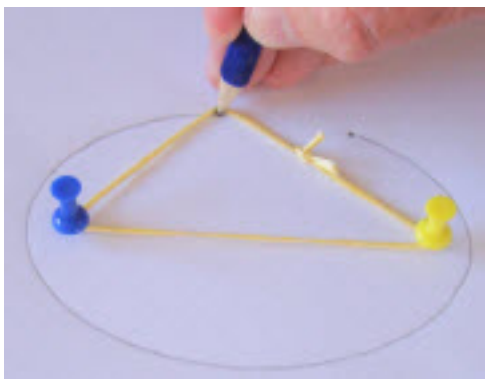
More Advanced Topics in Plane Geometry

Pythagoras



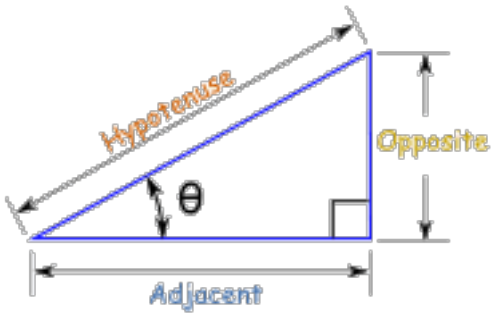
- Pythagoras' Theorem
- Pythagorean Triples

Conic Sections



- Set of all points
- Conic Sections
- Ellipse
- Parabola
- Hyperbola

Trigonometry



Trigonometry is a special subject of its own, so you might like to visit:

- Introduction to Trigonometry

- Trigonometry Index

Solid Geometry

Solid Geometry is the geometry of three-dimensional space - the kind of space we live in ...

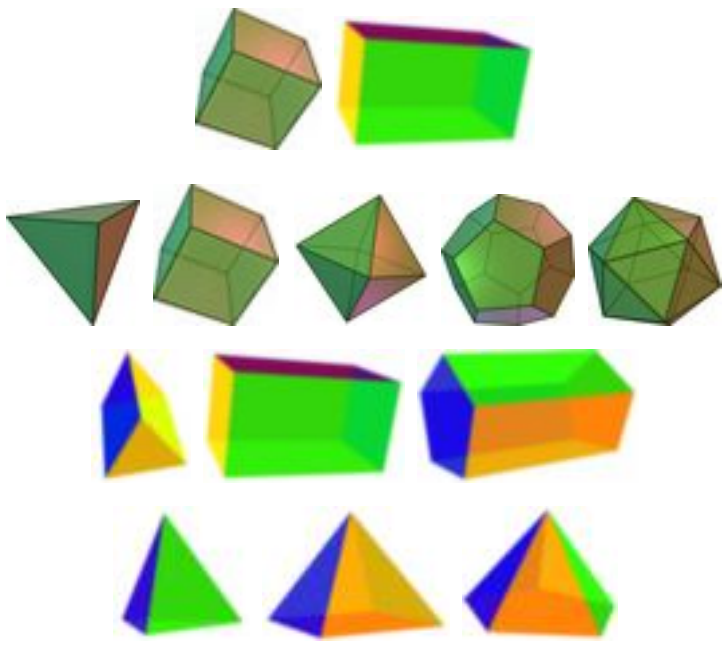
... let us start with some of the simplest shapes:

Common 3D Shapes

Polyhedra and Non-Polyhedra

There are two main types of solids, "Polyhedra", and "Non-Polyhedra":

Polyhedra :
(they must have flat faces)



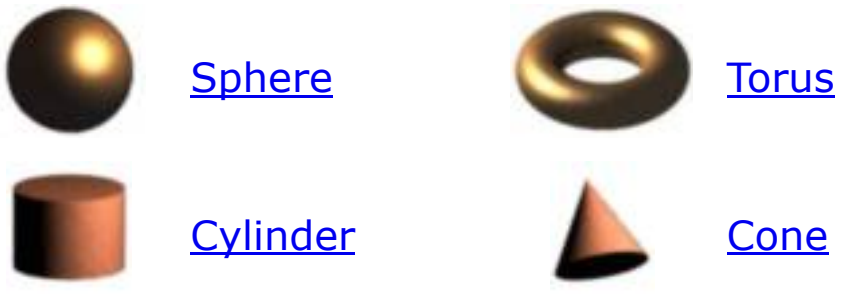
Cubes and Cuboids (Volume of a Cuboid)

Platonic Solids

Prisms

Pyramids

Non-Polyhedra:
(if any surface is not flat)



Sphere

Torus

Cylinder

Cone

- Polyhedron Models

- Vertices, Faces, and Edges
- Euler's Theorem