

# *Menu*

## *Organic Mathematics*

### Numbers

- *Integers*
- *Ordering of numbers*
- *Rounding of numbers*
- *Adding and subtraction of numbers*
- *Dividing whole numbers*
- *BIDMAS*
- *Inverse operations*

### Negative numbers

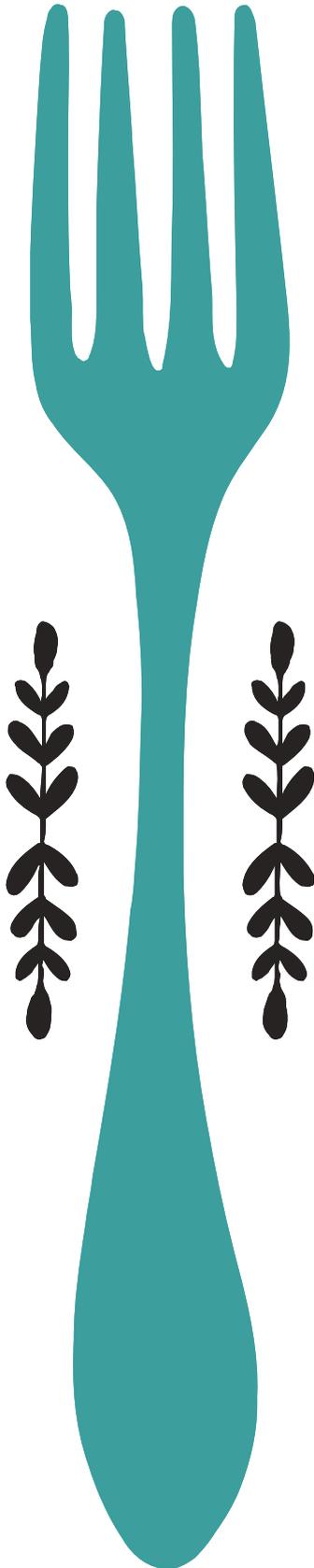
- *Understanding negative numbers*

### Decimals

- *Integers and decimals: the four basic operations*
- *Ordering decimals*
- *Order of operations: BIDMAS*
- *Rounding decimals*
- *Estimating decimals*
- *Recognizing their corresponding fractions*

### Factors, primes & powers

- *Multiples, factors & prime numbers*
- *Highest common factor (HFC) and lowest common multiple (LCM)*
- *Squares, cubes and roots*
- *Index form*
- *Reciprocals*



## Fractions

- *Equivalent fractions*
- *Adding and subtracting fractions*
- *Multiplying and dividing fractions*
- *Comparing fractions*
- *Improper fractions and mixed numbers*
- *Performing calculations and mixed numbers*
- *Solving problems involving fractions*

## Fractions, decimals and percentages

- *Converting fractions*
- *Converting decimals*
- *Converting percentages*
- *Ordering decimals, fractions and percentages*
- *Recurring decimals*

## Index notation and surds

- *Index form and the law of indices*
- *Fractional indices*
- *Standard form*
- *Surds*

## Percentages

- *Writing one quantity as a percentage of another*
- *Calculating the percentage of an amount*
- *Increasing or decreasing an amount by a percentage*
- *Real-life percentage problems*
- *Percentage of a quantity*
- *Multiplier use in calculations*

- *Profit and loss*
- *Compound and simple interest*

## Percentages (cont....)

- *Depreciation*
- *Reverse percentages*

## Ratios, proportions and rate of change

- *Simplifying a ratio*
- *Unitary form*
- *Solving ratio problems*
- *Direct and inverse proportion*
- *More complex direct and inverse proportion problems*
- *Simplifying a ratio*
- *Unitary form*
- *Ratio problems*
- *Dividing a quantity into a given ratio*
- *Direct proportion*

## Set notation and Venn diagram

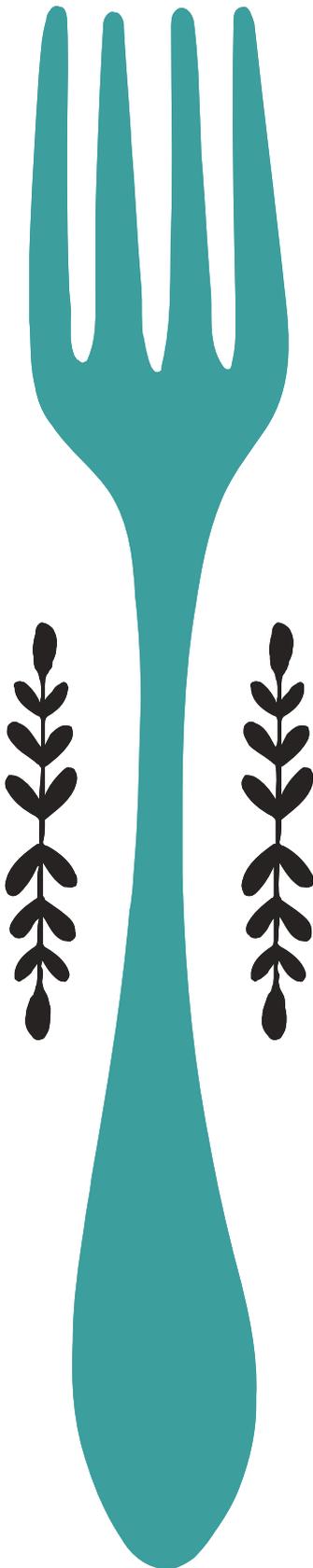
- *Use set notations and Venn diagram*

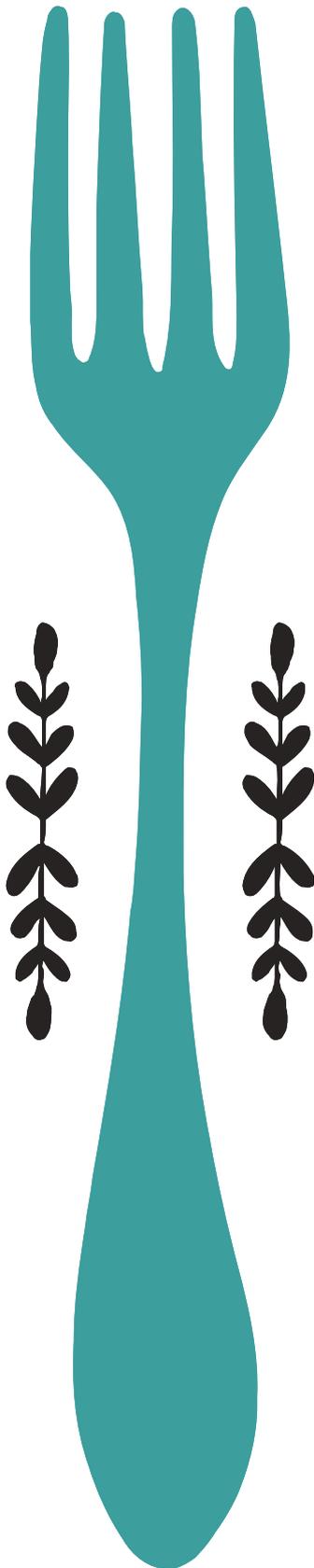
## Algebra – Calculus

- *Variable rates of change and differentiation*
- *Gradients*
- *Turning points*
- *Motion of a particle*

## Algebraic expressions

- *Evaluating expressions*





- *Simplifying expressions*
- *Multiplying out a pair of brackets*
- *Introduction to factorizing*

## Algebraic expressions (cont..)

- *Factorizing a quadratic*
- *Factorizing a more complex quadratic*
- *Simplifying algebraic fractions*
- *Writing an expression*
- *Evaluating and simplifying an expression*
- *Multiplying in algebra*
- *Expanding a triple bracket*

## Algebraic statements

- *Equation, expression or formula*

## Linear equation

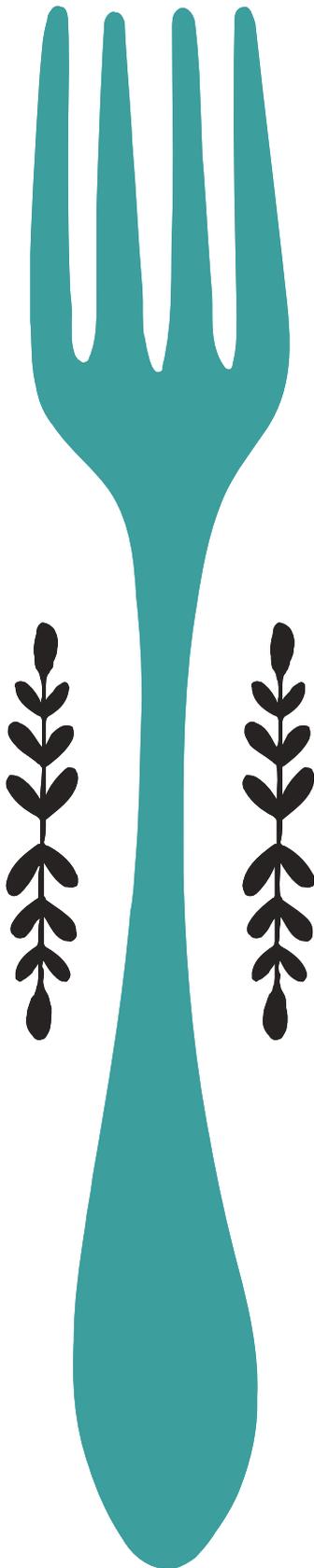
- *Method for solving equations*
- *Setting up and solving equation*
- *Solving equations with an unknown on both sides*
- *Solving equations which contain bracket*
- *Solving equations with brackets and negative number*
- *Solving equations containing brackets or fractions*

## Function

- *Understanding and use function notations*

## Further graphs

- *Cubic function*
- *Reciprocal functions*
- *Exponential functions*



- *Equations and their graphs*
- *Trigonometric functions*
- *Graph of the circle*
- *Using graphs to solve a pair of equation*

## Further graphs (cont....)

- *Gradients and areas under graphs*
- *More on equation of the circle*

## Index notation

- *Using index notation*

## Inequalities

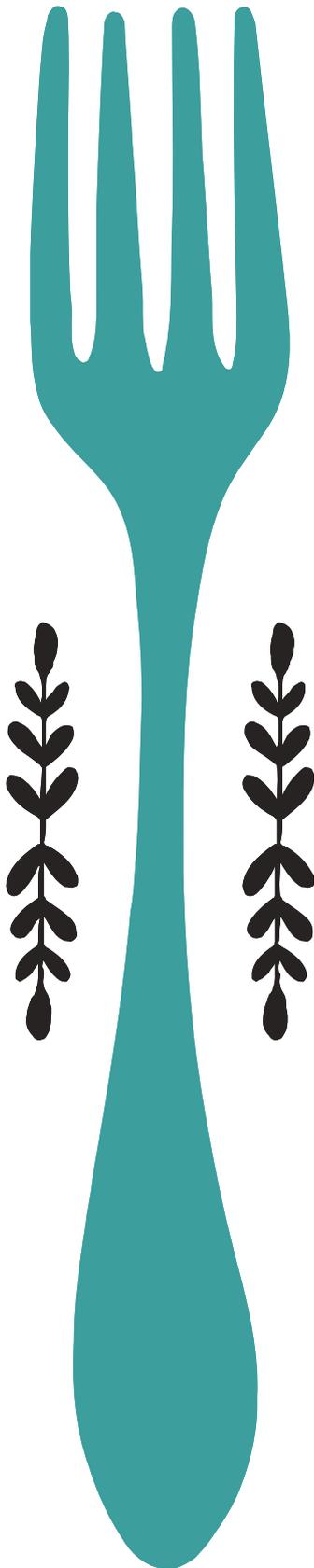
- *Solving inequalities and showing inequalities on a number line*
- *Finding integer solutions to an inequality*
- *Solving inequalities with two variables graphically*

## Linear graphs

- *Simple linear graphs*
- *Using  $y = mx + c$*
- *Parallel and perpendicular lines*

## Number patterns and sequences

- *Introduction to number sequences*
- *The  $n$ th term*
- *Geometric progressions*
- *Quadratic sequences*



## Quadratic equations

- *Factorizing quadratic equations: example*
- *Solving quadratic equations by completing the square*
- *The quadratic formula*

## Quadratic equations (cont...)

- *Equations with algebraic fractions*
- *Problems involving quadratic equations*

## Quadratic graphs

- *Plotting quadratic graphs*
- *Solving quadratic equations: example*
- *Finding turning points*

## Real-life graphs

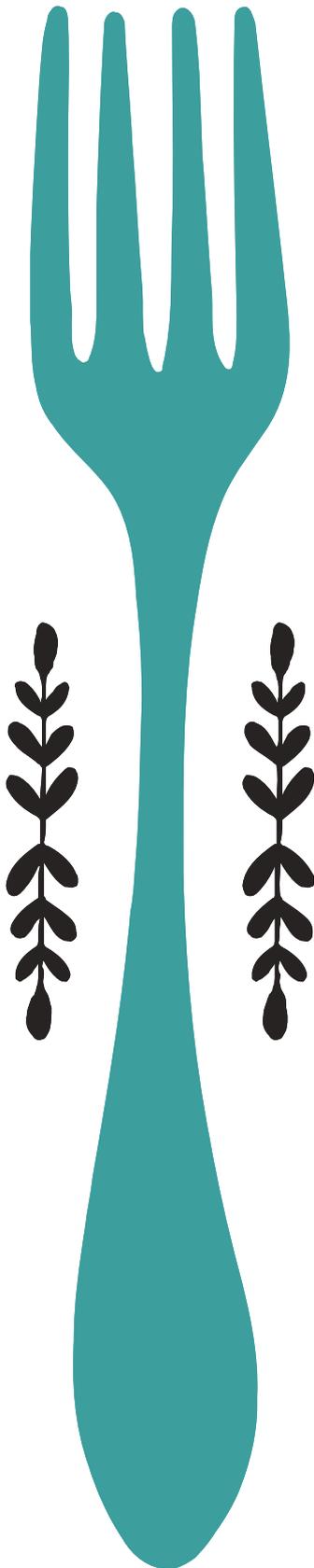
- *Real-life plots and graphs*

## Simultaneous equations

- *Solving simultaneous equations using elimination*
- *Solving simultaneous equation using substitution*
- *Solving simultaneous equations*
- *Graphically*
- *Setting up and solving simultaneous equations*
- *Solving a liner and quadratic equation simultaneously*

## Substitution

- *Substitution in an expression*



## Transformation of functions

- *Types of transformation*
- *Translation*

## Trial and improvement

- *Trial and improvement*
- *Finding an approximate solution using trial and improvement*
- *Iterative methods*

## Geometry – angles & lines

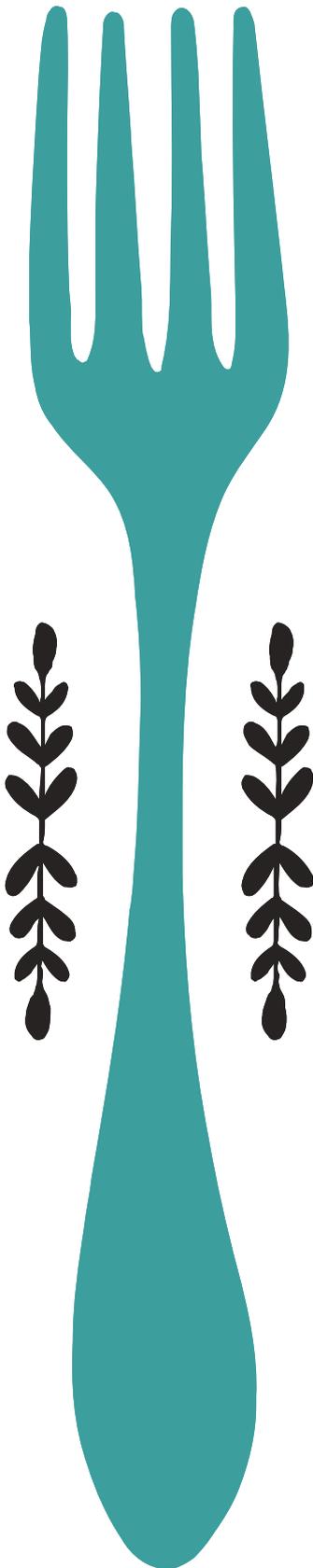
- *Types of angles*
- *Estimating the size of an angle*
- *Mearing angles and lengths*
- *Parallel and perpendicular lines*
- *Constructing an angle*
- *Constructing a triangle*
- *Angles on a straight line and angles on a point*

## Angles and polygons

- *Triangles and Quadrilaterals*
- *Interior and exterior angles in a polygon*
- *Corresponding and alternative angles*
- *Proving angle facts*
- *bearings*

## Shapes and angles

- *Angle facts: triangle*
- *Angle facts: quadrilaterals*
- *Interior and exterior angles*
- *Parallel lines*
- *Bearings*



## Circles

- *The circle*
- *Circumference and area*
- *Circles and arcs*
- *Sectors and segments*

## Circle (cont...)

- *Circle theorems*
- *Circle theorem: examples*

## Construction and loci

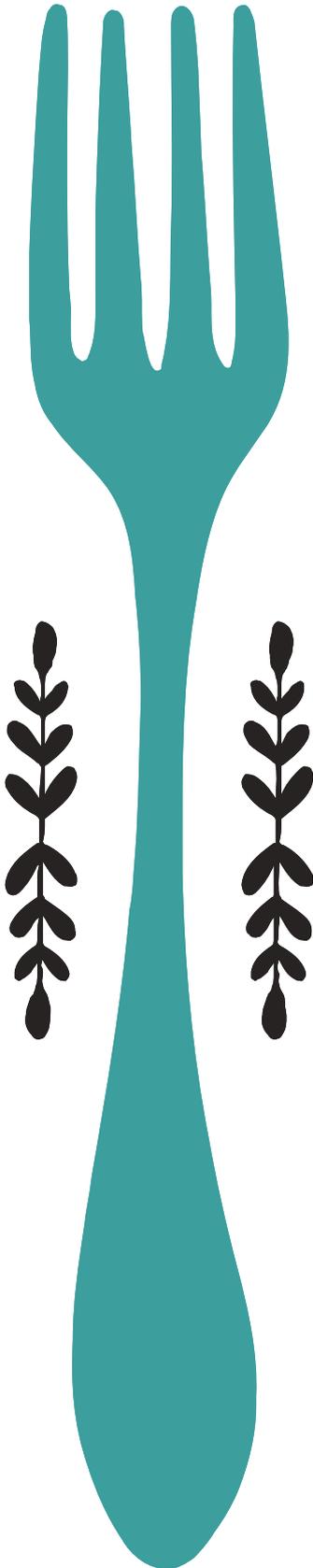
- *Constructing a triangle*
- *Constructing other shapes*
- *Constructing a perpendicular bisector of a line*
- *Bisecting an angle*
- *Constructing the perpendicular from a point to a line*
- *Constructing the perpendicular to a line from a point on the line*
- *Constructing the locus of points from a fixed point*
- *Constructing the locus of points from a fixed line*
- *Constructing a region that satisfies*
- *A given set of conditions*

## Co-ordinates

- *Understanding co-ordinates*
- *3-D co-ordinates*

## Matrices

- *Adding, subtracting and multiplying matrices by a scalar*
- *Multiplying 2 matrices together*
- *Finding the inverse of a matrix*



## Measure

- *Imperial and metric units*
- *Convert metric units*
- *Speed, distance and time*
- *Mass, density and volume*

## Measure (cont....)

- *Converting metric units*
- *Converting imperial units*
- *Speed, distance and time conversion*
- *Mass, density and volume conversion*
- *Length, area or volume expression*
- *Upper and lower bounds*

## Measuring from scales

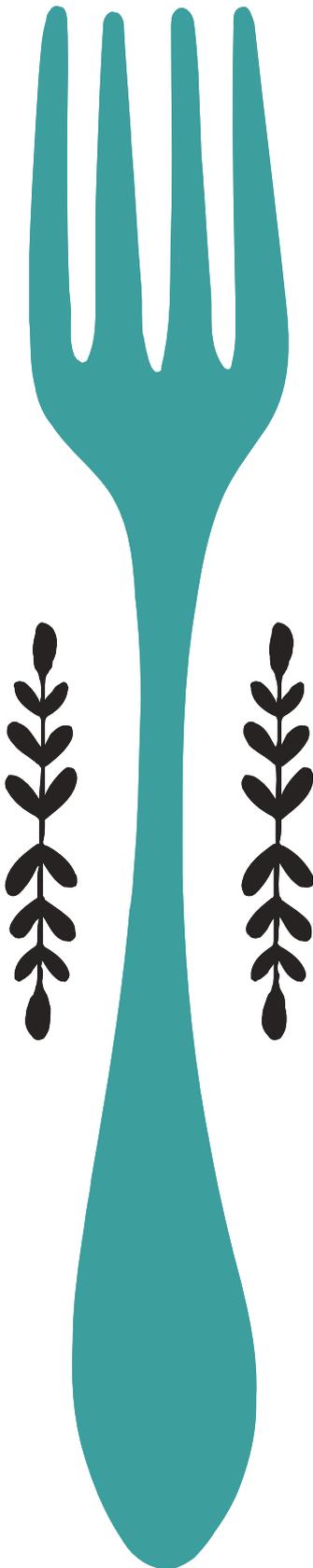
- *Measurements and scales*
- *Time and unit*
- *Timetable*

## Perimeter and area

- *Calculating perimeters*
- *Calculating areas*
- *Compound shapes*
- *Converting units*
- *Area and perimeter of 2-d shape*
- *Area and circumference of a circle*
- *Converting between units of measure*

## Volume and surface area

- *Volume of 3-D shape*
- *Converting units of volume*
- *Surface area of a prism and a cylinder*
- *Surface area of a cone*



## 3-D shape

- *Names and nets of common shapes*
- *Front and side elevation*
- *Using elevation to draw shapes*
- *Planes of symmetry*

## Pythagoras' theorem

- *Finding the hypotenuse*
- *Finding the shorter side*
- *Calculating the distance between two points*
- *Pythagoras' theorem and real-life problems*
- *3-dimensional shapes*

## Similarity and congruence

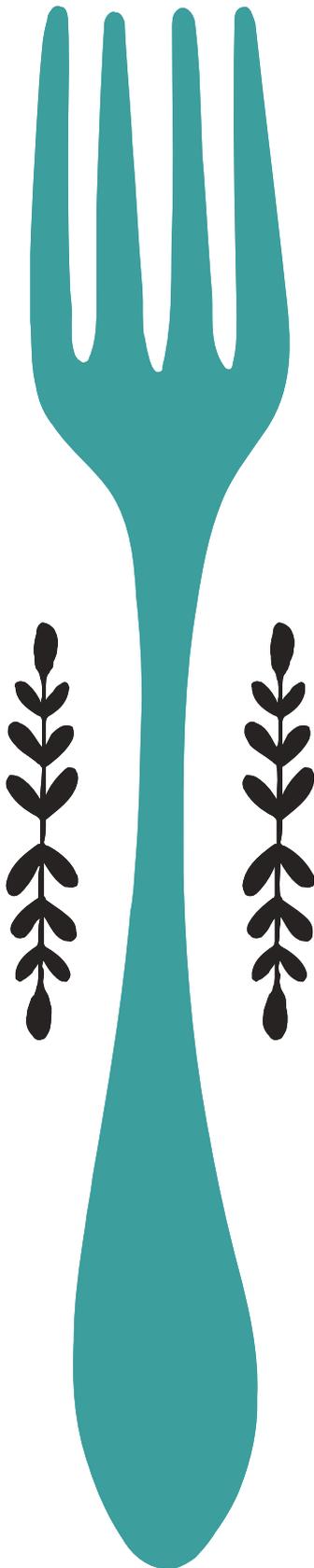
- *Calculating sides and areas of similar shapes*
- *Calculating volumes of similar 3-d shapes*
- *Volume and areas of similar solids*
- *Congruence*

## Similarity, congruence and symmetry

- *Similarity and congruence*
- *Line symmetry*
- *Rotational symmetry*
- *Tessellation*

## Surface and volume

- *Calculating volume of 3-D shapes*
- *Converting units of volume*
- *Calculating the surface area of a prism*



## Transformation

- *Rotation*
- *Reflection*
- *Enlargement*
- *Multiple*
- *Transformations and describing these as a single transformation*

## Transformation (cont...)

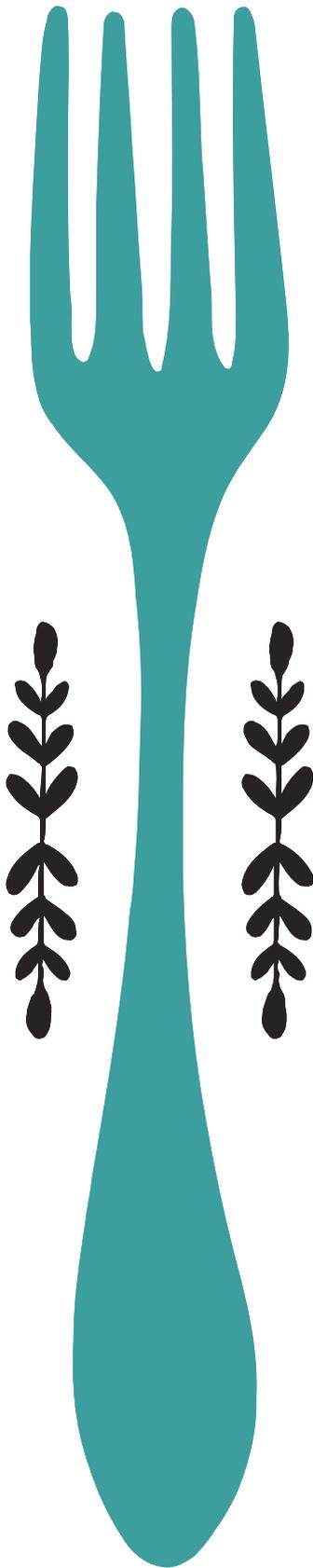
- *Enlargement*
- *Multiple transformation*
- *Additional transformation*

## Trigonometry

- *The three trigonometric ratios*
- *Using trigonometry to find a length*
- *Using trigonometry to find angles*
- *Using trigonometry to solve problems*
- *Using trigonometry in -d shapes*
- *The area of a triangle*
- *The sine rule*
- *The cosine rule*
- *Special triangles*

## Vectors

- *Vector quantities*
- *The law of vector addition*
- *Parallel*
- *Vectors*
- *Solving geometric problems*
- *Involving vectors*



## Statistics

- *Averages*
- *Collecting data*
- *Presenting data*

## Probabilities

- *The probability scale and writing probabilities*
- *Two-way probability table*
- *Mutually exclusive events*
- *Independent events*

## Probabilities (cont....)

- *Probability tree*
- *Relative frequency*
- *Venn diagrams to find probabilities*