

# Glossary

The following definitions of terms are intended to help teachers and parents use this document.

**acute angle.** An angle whose measure is between  $0^\circ$  and  $90^\circ$ .

**addition.** The operation that represents the sum of two or more numbers. The inverse operation of addition is subtraction.

**algebra tiles.** Learning tools that can be used to model operations involving integers, expressions, and equations. Each tile represents a particular term, such as 1,  $x$ , or  $x^2$ .

**algorithm.** A systematic procedure for carrying out a computation. For example, the addition algorithm is a set of rules for finding the sum of two or more numbers.

**alternate angles.** Two angles on opposite sides of a transversal when it crosses two lines. The angles are equal when the lines are parallel. The angles form one of these patterns:  $\sphericalangle$ ,  $\sphericalangle$ .

**analogue clock.** A timepiece that measures the time through the position of its hands.

**angle.** A shape formed by two rays or two line segments with a common endpoint. See also **vertex**.

**area model.** A diagrammatic representation that uses area to demonstrate other mathematical concepts. In an area model for multiplication, for example, the length and width of a rectangle represent the factors, and the area of the rectangle represents the product. The diagram shows the use of an area model to represent  $26 \times 14$ .

	20	6
10	200	60
4	80	24

$$26 \times 14 = 200 + 60 + 80 + 24 \\ = 364$$

**array.** A rectangular arrangement of objects into rows and columns, used to represent multiplication (e.g.,  $5 \times 3$  can be represented by 15 objects arranged into 5 columns and 3 rows).

**associative property.** A property of addition and multiplication that allows the numbers being added or multiplied to be regrouped without changing the outcome of the operations. For example,  $(7 + 9) + 1 = 7 + (9 + 1)$  and  $(7 \times 4) \times 5 = 7 \times (4 \times 5)$ . In general,  $(a + b) + c = a + (b + c)$  and  $(a \times b) \times c = a \times (b \times c)$ . Using the associative property can simplify computation. This property does not generally hold for subtraction or division.

**attribute.** A quantitative or qualitative characteristic of a shape, an object, or an occurrence; for example, colour, size, thickness, or number of sides. An attribute may or may not be a property. See also **property (geometric)**.

**attribute blocks.** Learning tools that help students learn about shapes, sorting, patterning, congruence, similarity, geometric properties, and so on. The standard set of attribute blocks (60 blocks) includes five shapes (rectangle, square, circle, triangle, hexagon); each shape comes in three colours (red, yellow, blue), two sizes (large, small), and two thicknesses (thick, thin).

**bar graph.** See *under* **graph**.

**base.** See **exponential form**.

**base ten materials.** Learning tools that help students learn a wide variety of concepts in number sense, including place value; the operations (addition, subtraction, multiplication, and division); and fractions and decimals. Sets of base ten materials typically include ones (small cubes called “units”), tens (“rods” or “longs”), hundreds (“flats”), and thousands (large cubes).

**benchmark.** A number or measurement that is internalized and used as a reference to help judge other numbers or measurements. For example, the width of the tip of the little finger is a common benchmark for one centimetre. Also called *referent*.

**bias.** An emphasis on characteristics that are not typical of an entire population and that may result in misleading conclusions.

**bisector.** A line that divides a segment or an angle into two equal parts. A line that divides another line in half and intersects that line at a  $90^\circ$  angle is called a *perpendicular bisector*.

**broken-line graph.** *See under graph.*

**capacity.** The greatest amount that a container can hold; usually measured in litres or millilitres.

**cardinal directions.** The four main points of the compass: north, east, south, and west.

**Cartesian coordinate grid.** *See coordinate plane.*

**Cartesian plane.** *See coordinate plane.*

**categorical data.** Data that can be sorted by type or quality, rather than by measured or counted values. Eye colour and favourite food are examples of categorical data.

**census.** The collection of data from an entire population.

**circle.** The points on a plane that are all the same distance from a centre.

**circle graph.** *See under graph.*

**clustering.** *See under estimation strategies.*

**coefficient.** A factor of a term. In a term that contains a number and a variable (or variables), connected by multiplication, the numerical factor is the numerical coefficient, and the variable factor is the variable coefficient. For example, in  $5y$ , 5 is the numerical coefficient and  $y$  is the variable coefficient.

**commutative property.** A property of addition and multiplication that allows the numbers to be added or multiplied in any order, without affecting the sum or product of the operation. For example,  $2 + 3 = 3 + 2$  and  $2 \times 3 = 3 \times 2$ . In general,  $a + b = b + a$  and  $a \times b = b \times a$ . Using the commutative property can simplify computation. This property does not generally hold for subtraction or division.

**comparative bar graph.** *See double bar graph under graph.*

**compass.** A tool used for drawing arcs and circles.

**compatible numbers.** Numbers that are easy to compute mentally and can be used to estimate or calculate an answer. Also called *friendly numbers*. *See using compatible numbers under estimation strategies.*

**complementary angles.** Two angles whose sum is  $90^\circ$ .

**complementary events.** Two events that have no outcome(s) in common but that account for all possible outcomes of an experiment. For example, rolling an even number and rolling an odd number using a number cube are complementary events. The sum of the probabilities of complementary events is 1. *See also event.*

**composite number.** A number that has factors in addition to itself and 1. For example, the number 8 has four factors: 1, 2, 4, and 8. *See also prime number.*

**computational strategies.** Any of a variety of methods used for performing computations; for example, estimation, mental calculation, student-generated and standard algorithms, and the use of technology (including calculators and computer spreadsheets).

**concrete graph.** *See under graph.*

**concrete materials.** Objects that students handle and use in constructing or demonstrating their understanding of mathematical concepts and skills. Some examples of concrete materials are base ten blocks, connecting cubes, construction kits, number cubes, games, geoboards, geometric solids, measuring tapes, Miras, pattern blocks, spinners, and tiles. Also called *manipulatives*.

**cone.** A three-dimensional figure with a circular base and a curved surface that tapers proportionally to an apex.

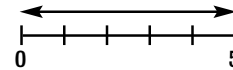


**congruent.** Having the same size and shape. For example, in two congruent triangles, the three corresponding pairs of sides and the three corresponding pairs of angles are equal.

**connecting cubes.** Commercially produced learning tools that help students learn about spatial sense, volume, surface area, patterning, and so on. Some connecting cubes attach on only one face, while others attach on any face.

**conservation.** The property by which something remains the same, despite changes such as physical arrangement. For example, with conservation of number, whether three objects are close together or far apart, the quantity remains the same.

**continuous data.** Data that can include any numerical value that is represented on a number line and that falls within the range of the data, including decimals and fractions. Continuous data usually represent measurements, such as time, height, and mass. *See also discrete data.*



**continuous line graph.** *See under graph.*

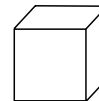
**coordinate graph.** *See under graph.*

**coordinate plane.** A plane that contains an  $x$ -axis (horizontal) and a  $y$ -axis (vertical), which are used to describe the location of a point. Also called *Cartesian coordinate grid* or *Cartesian plane*.

**coordinates.** An ordered pair used to describe location on a grid or plane. For example, the coordinates (3, 5) describe a location found by moving 3 units to the right and 5 units up from the *origin* (0, 0). *See also ordered pair.*

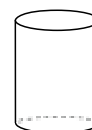
**counter-example.** An example that shows a general statement to be false.

**cube.** A right rectangular prism with six congruent square faces. A cube is one of the Platonic solids. Also called a *hexahedron*.



**Cuisenaire rods.** Commercially produced learning tools that help students learn about fractions, patterning, and so on. This set of rectangular rods of different lengths, in which each length is a different colour, was invented by Georges Cuisenaire (1891–1976), a Belgian schoolteacher.

**cylinder.** A three-dimensional figure with two congruent, parallel, circular faces and one curved surface.



**data.** Facts or information. *See also categorical data, continuous data, and discrete data.*

**database.** An organized and sorted list of facts or information; usually generated by a computer.

**deductive reasoning.** The process of reaching a conclusion by applying arguments that have already been proved and using evidence that is known to be true. Generalized statements are used to prove whether or not specific statements are true.

**degree.** A unit for measuring angles. For example, one full revolution measures  $360^\circ$ .

**denominator.** The number below the line in a fraction. For example, in  $\frac{3}{4}$ , the denominator is 4. *See also numerator.*

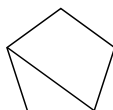
**dependent variable.** A variable whose value depends on the value of another variable. In graphing, the dependent variable is represented on the vertical axis. *See also independent variable.*

**diagonal.** A line segment joining two vertices of a polygon that are not next to each other (i.e., that are not joined by one side).

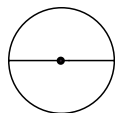
diagonal in a rectangle



diagonal in a pentagon

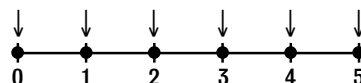


**diameter.** A line segment that joins two points on a circle and passes through the centre.



**dilatation.** A transformation that enlarges or reduces a shape by a scale factor to form a similar shape.

**discrete data.** Data that can include only certain numerical values (often whole numbers) within the range of the data. Discrete data usually represent things that can be counted; for example, the number of times a word is used or the number of students absent. There are gaps between the values. For example, if whole numbers represent the data, as shown in the following diagram, fractional values such as  $3\frac{1}{2}$  are not part of the data. *See also continuous data.*



**displacement.** The amount of water displaced by an object placed in it. Measuring the amount of water displaced when an object is completely immersed is a way to find the volume of the object.

**distribution.** An arrangement of measurements and related frequencies; for example, a table or graph that shows how many times each score, event, or measurement occurred.

**distributive property.** The property that allows a number in a multiplication expression to be decomposed into two or more numbers; for example,  $51 \times 12 = 51 \times 10 + 51 \times 2$ . More formally, the distributive property holds that, for three numbers,  $a$ ,  $b$ , and  $c$ ,  $a \times (b + c) = (a \times b) + (a \times c)$  and  $a \times (b - c) = (a \times b) - (a \times c)$ ; for example,  $2 \times (4 + 1) = 2 \times 4 + 2 \times 1$  and  $2 \times (4 - 1) = 2 \times 4 - 2 \times 1$ . Multiplication is said to be distributed over addition and subtraction.

**division.** The operation that represents repeated subtraction or the equal sharing of a quantity. The inverse operation of division is multiplication.

**dodecahedron.** A polyhedron with 12 faces. The regular dodecahedron is one of the Platonic solids and has faces that are regular pentagons.

regular dodecahedron



**double bar graph.** See *under graph*.

**dynamic geometry software.** Computer software that allows the user to explore and analyse geometric properties and relationships through dynamic dragging and animations. Uses of the software include plotting points and making graphs on a coordinate system; measuring line segments and angles; constructing and transforming two-dimensional shapes; and creating two-dimensional representations of three-dimensional objects. An example of the software is *The Geometer's Sketchpad*.

**dynamic statistical software.** Computer software that allows the user to gather, explore, and analyse data through dynamic dragging and animations. Uses of the software include organizing data from existing tables or the Internet, making different types of graphs, and determining measures of central tendency. Examples of the software include *TinkerPlots* and *Fathom*.

**equation.** A mathematical statement that has equivalent expressions on either side of an equal sign.

**equilateral triangle.** A triangle with three equal sides.

**equivalent fractions.** Different representations in fractional notation of the same part of a whole or group; for example,  $\frac{1}{3}$ ,  $\frac{2}{6}$ ,  $\frac{3}{9}$ ,  $\frac{4}{12}$ .

**equivalent ratios.** Ratios that represent the same comparison, and whose fractional forms reduce to the same value; for example, 1:3, 2:6, 3:9, 4:12.

**estimation strategies.** Mental mathematics strategies used to obtain an approximate answer. Students estimate when an exact answer is not required, and to check the reasonableness of their mathematics work. Some estimation strategies are:

- **clustering.** A strategy used for estimating the sum of numbers that cluster around one particular value. For example, the numbers 42, 47, 56, 55 cluster around 50. So estimate  $50 + 50 + 50 + 50 = 200$ .

- **rounding.** A process of replacing a number by an approximate value of that number. For example,  $193 + 428 + 253$  can be estimated by rounding to the nearest 100. So estimate  $200 + 400 + 300 = 900$ .

- **using compatible numbers.** A process of identifying and using numbers that can be computed mentally. For example, to estimate  $28 \div 15$ , dividing the compatible numbers 30 and 15, or the compatible numbers 28 and 14, results in an estimate of about 2. See also **compatible numbers**.

**event.** A possible outcome, or group of outcomes, of an experiment. For example, rolling an even number on a number cube is an event with three possible outcomes: 2, 4, and 6.

**expanded form.** A way of writing numbers that shows the value of each digit; for example,  $432 = 4 \times 100 + 3 \times 10 + 2$ . See also **place value, standard form**.

**experimental probability.** The likelihood of an event occurring, determined from experimental results rather than from theoretical reasoning.

**exponent.** See **exponential form**.

**exponential form.** A representation of a product in which a number called the *base* is multiplied by itself. The *exponent* is the number of times the base appears in the product. For example,  $5^4$  is in exponential form, where 5 is the base and 4 is the exponent;  $5^4$  means  $5 \times 5 \times 5 \times 5$ .

**expression.** A numeric or algebraic representation of a quantity. An expression may include numbers, variables, and operations; for example,  $3 + 7$ ,  $2x - 1$ .

**factors.** Natural numbers that divide evenly into a given natural number. For example, the factors of 12 are 1, 2, 3, 4, 6, and 12, because all of these numbers divide evenly into 12. See also **multiplication**.

**flip.** See **reflection**.

**formula.** An equation summarizing a relationship between measurable attributes; for example, for a right prism,  $Volume = area\ of\ base \times height$ .

**fraction circles.** Learning tools that help students learn about fractions. Common commercially produced fraction circle sets, made of foam or plastic, have circles cut into halves, thirds, fourths, and so on, in different colours.

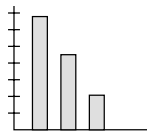
**frequency.** The number of times an event or outcome occurs.

**general term.** An algebraic expression that represents any term in a pattern or sequence, based on the term number. For example, in the sequence 2, 4, 6, 8, 10, ..., the general term is  $2n$ . Also called *nth term*.

**geoboard.** A commercially produced learning tool that helps students learn about perimeter, area, fractions, transformations, and so on. A geoboard is a square piece of plastic or wood with pins arranged in a grid or in a circle. Elastics are used to connect the pins to make different shapes.

**graph.** A visual representation of data. Some types of graphs are:

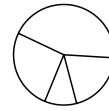
- **bar graph.** A graph consisting of horizontal or vertical bars that represent the frequency of an event or outcome. There are gaps between the bars to reflect the categorical or discrete nature of the data.



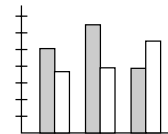
- **broken-line graph.** A graph formed by line segments that join points representing the data. The horizontal axis represents discrete quantities such as months or years, whereas the vertical axis can represent continuous quantities.



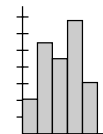
- **circle graph.** A graph in which a circle is used to display categorical data, through the division of the circle proportionally to represent each category.



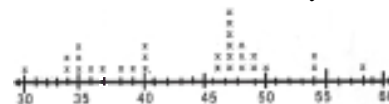
- **concrete graph.** A graph on which real objects are used to represent pieces of information; for example, coloured candy directly placed on a template of a bar graph.
- **continuous line graph.** A graph that consists of an unbroken line and in which both axes represent continuous quantities, such as distance and time.
- **coordinate graph.** A graph that has data points represented as ordered pairs on a grid; for example, (4, 3). See also **ordered pair**.
- **double bar graph.** A graph that combines two bar graphs to compare two aspects of the data in related contexts; for example, comparing the populations of males and females in a school in different years. Also called *comparative bar graph*.



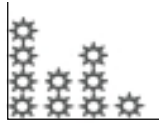
- **histogram.** A type of bar graph in which each bar represents a range of values, and the data are continuous. No spaces are left between the bars, to reflect the continuous nature of the data.



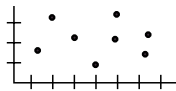
- **line plot.** A graph that shows a mark (usually an “X”) above a value on the number line for each entry in the data set.



- **pictograph.** A graph that uses pictures or symbols to compare frequencies.



- **scatter plot.** A graph designed to show a relationship between corresponding numbers from two sets of data measurements associated with a single object or event; for example, a graph of data about marks and the corresponding amount of study time. Drawing a scatter plot involves plotting ordered pairs on a coordinate grid. Also called *scatter diagram*.



- **stem-and-leaf plot.** An organization of data into categories based on place values. The plot allows easy identification of the greatest, least, and median values in a set of data. The following stem-and-leaf plot represents these test results: 72, 64, 68, 82, 75, 74, 68, 70, 92, 84, 77, 59, 77, 70, 85.

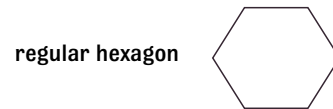
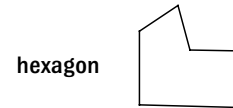
5	9
6	4, 8, 8
7	0, 0, 2, 4, 5, 7, 7
8	2, 4, 5
9	2

**greatest common factor.** The largest factor that two or more numbers have in common. For example, the greatest common factor of 16 and 24 is 8.

**heptagon.** A polygon with seven sides.



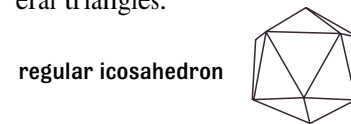
**hexagon.** A polygon with six sides.



**histogram.** See *under graph*.

**hundreds chart.** A  $10 \times 10$  table or chart with each cell containing a natural number from 1 to 100 arranged in order.

**icosahedron.** A polyhedron with 20 faces. The regular icosahedron is one of the Platonic solids and has faces that are equilateral triangles.



**improper fraction.** A fraction whose numerator is greater than its denominator; for example,  $\frac{12}{5}$ .

**independent events.** Two or more events where one does not affect the probability of the other(s); for example, rolling a 6 on a number cube and drawing a red card from a deck.

**independent variable.** A variable for which values are freely chosen and do not depend on the values of other variables. In graphing, the independent variable is represented on the horizontal axis. See *also dependent variable*.

**inductive reasoning.** The process of reaching conclusions based on observations of patterns. Specific statements and observations are used to make generalizations.

**inference.** A conclusion drawn from any method of reasoning. See *also deductive reasoning, inductive reasoning*.

**integer.** Any one of the numbers  $\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots$

**intersecting lines.** Lines that cross each other and that have exactly one point in common, the point of intersection.

**interval.** The set of points or the set of numbers that exist between two given endpoints. The endpoints may or may not be included in the interval. For example, test score data can be organized into intervals such as 65–69, 70–74, 75–79, and so on.

**inverse operations.** Two operations that “undo” or “reverse” each other. For example, for any number, adding 7 and then subtracting 7 gives the original number. The subtraction undoes or reverses the addition.

**irrational number.** A number that cannot be represented as a terminating or repeating decimal; for example,  $\sqrt{5}$ ,  $\pi$ .

**irregular polygon.** A polygon that does not have all sides and all angles equal. *See also* **regular polygon**.

**isometric dot paper.** Dot paper used for creating perspective drawings of three-dimensional figures. The dots are formed by the vertices of equilateral triangles. Also called *triangular dot paper* or *triangle dot paper*.

**isosceles triangle.** A triangle that has two sides of equal length.

**least common multiple.** The smallest number that two numbers can divide into evenly. For example, 30 is the least common multiple of 10 and 15.

**line of symmetry.** A line that divides a shape into two congruent parts that can be matched by folding the shape in half.

**linear dimension.** A measurement of one linear attribute; that is, distance, length, width, height, or depth.

**linear equation.** An algebraic representation of a linear relationship. The relationship involves one or more first-degree variable terms; for example,  $y = 2x - 1$ ;  $2x + 3y = 5$ ;  $y = 3$ . The graph of a linear equation is a straight line.

**linear relationship.** A relationship between two measurable quantities that appears as a straight line when graphed on a coordinate system.

**line plot.** *See under* **graph**.

**magnitude.** An attribute relating to size or quantity.

**manipulatives.** *See* **concrete materials**.

**many-to-one correspondence.** The correspondence of more than one object to a single symbol or picture. For example, on a pictograph, five cars can be represented by one sticker. *See also* **one-to-one correspondence**.

**mass.** The amount of matter in an object; usually measured in grams or kilograms.

**mathematical communication.** The process through which mathematical thinking is shared. Students communicate by talking, drawing pictures, drawing diagrams, writing journals, charting, dramatizing, building with concrete materials, and using symbolic language (e.g.,  $2 = 2$ ).

**mathematical concept.** A connection of mathematical ideas that provides a deep understanding of mathematics. Students develop their understanding of mathematical concepts through rich problem-solving experiences.

**mathematical conventions.** Agreed-upon rules or symbols that make the communication of mathematical ideas easier.

**mathematical language.** The conventions, vocabulary, and terminology of mathematics. Mathematical language may be used in oral, visual, or written forms. Some types of mathematical language are:

- terminology (e.g., factor, pictograph, tetrahedron);
- visual representations (e.g.,  $2 \times 3$  array, parallelogram, tree diagram);
- symbols, including numbers (e.g.,  $2$ ,  $\frac{1}{4}$ ), operations [e.g.,  $3 \times 8 = (3 \times 4) + (3 \times 4)$ ], and signs (e.g.,  $=$ ).



**mathematical procedures.** The operations, mechanics, algorithms, and calculations used to solve problems.

**mean.** One measure of central tendency. The mean of a set of numbers is found by dividing the sum of the numbers by the number of numbers in the set. For example, the mean of 10, 20, and 60 is  $(10 + 20 + 60) \div 3 = 30$ . A change in the data produces a change in the mean, similar to the way in which changing the load on a lever affects the position of the fulcrum if balance is maintained. *See also* **measure of central tendency**.

**measure of central tendency.** A value that summarizes a whole set of data; for example, the mean, the median, or the mode. A measure of central tendency represents the approximate centre of a set of data. Also called *central measure*. *See also* **mean, median, mode**.

**median.** The middle value in a set of values arranged in order. For example, 14 is the median for the set of numbers 7, 9, 14, 21, 39. If there is an even number of numbers, the median is the average of the two middle numbers. For example, 11 is the median of 5, 10, 12, and 28. *See also* **measure of central tendency**.

**mental strategies.** Ways of computing mentally, with or without the support of paper and pencil. *See also* **estimation strategies**.

**Mira.** A commercially produced transparent mirror. This learning tool is used in geometry to locate reflection lines, reflection images, and lines of symmetry, and to determine congruency and line symmetry.

**mixed number.** A number that is composed of a whole number and a fraction; for example,  $8\frac{1}{4}$ .

**mode.** The value that occurs most often in a set of data. For example, in a set of data with the values 3, 5, 6, 5, 6, 5, 4, 5, the mode is 5. *See also* **measure of central tendency**.

**modelling.** The process of describing a relationship using mathematical or physical representations.

**monomial.** An algebraic expression with one term; for example,  $2x$  or  $5xy$ .

**multiple.** The product of a given whole number multiplied by any other whole number except 1. For example, 4, 8, 12, ... are multiples of 4.

**multiplication.** An operation that represents repeated addition, the combining of equal groups, or an array. The multiplication of *factors* gives a product. For example, 4 and 5 are factors of 20 because  $4 \times 5 = 20$ . The inverse operation of multiplication is division. *See also* **factors**.

**multi-step problem.** A problem that is solved by making at least two calculations. For example, shoppers who want to find out how much money they will have left after some purchases can follow these steps:

Step 1 Add the costs of all items to be purchased (subtotal).

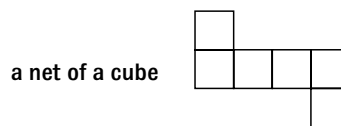
Step 2 Multiply the sum of the purchases by the percent of tax.

Step 3 Add the tax to the sum of the purchases (grand total).

Step 4 Subtract the grand total from the shopper's original amount of money.

**natural numbers.** The counting numbers 1, 2, 3, 4, ...

**net.** A pattern that can be folded to make a three-dimensional figure.

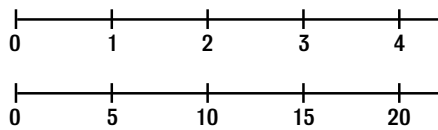


**non-standard units.** Common objects used as measurement units; for example, paper clips, cubes, and hand spans. Non-standard units are used in the early development of measurement concepts.

***n*th term.** See **general term**.

**number cube.** A learning tool that can help students learn a variety of concepts, including counting, operations, and probability. A number cube is a small cube that is typically made of plastic or wood. The faces are marked with different numerals or, in the case of dice, with different numbers of dots, usually representing the whole numbers from 1 to 6.

**number line.** A line that represents a set of numbers using a set of points. The increments on the number line reflect the scale.

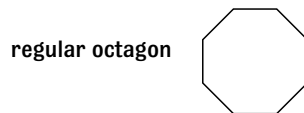
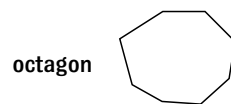


**number operations.** Procedures for combining numbers. The procedures include addition, subtraction, multiplication, and division.

**numerator.** The number above the line in a fraction. For example, in  $\frac{3}{4}$ , the numerator is 3. See also **denominator**.

**obtuse angle.** An angle that measures more than  $90^\circ$  and less than  $180^\circ$ .

**octagon.** A polygon with eight sides.



**octahedron.** A polyhedron with eight faces. The regular octahedron is one of the Platonic solids and has faces that are equilateral triangles.



**one-to-one correspondence.** The correspondence of one object to one symbol or picture. In counting, one-to-one correspondence is the idea that each object being counted must be given one count and only one count. See also **many-to-one correspondence**.

**order of operations.** A convention or rule used to simplify expressions. The acronym BEDMAS is often used to describe the order:

- brackets
- exponents
- division or
- multiplication, whichever comes first
- addition or
- subtraction, whichever comes first

**order of rotational symmetry.** The number of times the position of a shape coincides with its original position during one complete rotation about its centre. For example, a square has rotational symmetry of order 4. See also **rotational symmetry**.

**ordered pair.** Two numbers, in order, that are used to describe the location of a point on a plane, relative to a point of origin (0,0); for example, (2, 6). On a coordinate plane, the first number is the horizontal coordinate of a point, and the second is the vertical coordinate of the point. See also **coordinates**.

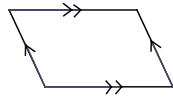
**ordinal number.** A number that shows relative position or place; for example, first, second, third, fourth.

**outlier.** A data point that is separated from the rest of the points on a graph. An outlier may indicate something unusual in the situation being studied, or an error in the data collection process.

**pan balance.** A device consisting of two pans supported at opposite ends of a balance beam. A pan balance is used to compare and measure masses of objects. Also called *double-pan balance*.

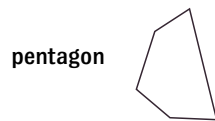
**parallel lines.** Lines in the same plane that do not intersect.

**parallelogram.** A quadrilateral whose opposite sides are parallel.



**pattern blocks.** Commercially produced learning tools that help students learn about shapes, patterning, fractions, angles, and so on. Standard sets include: green triangles; orange squares; tan rhombuses and larger blue rhombuses; red trapezoids; yellow hexagons.

**pentagon.** A polygon with five sides.



**percent.** A ratio expressed using the percent symbol, %. Percent means “out of a hundred”. For example, 30% means 30 out of 100. A percent can be represented by a fraction with a denominator of 100; for example,  $30\% = \frac{30}{100}$ .

**perfect square.** A number that can be expressed as the product of two identical natural numbers. For example,  $9 = 3 \times 3$ ; thus 9 is a perfect square.

**perimeter.** The length of the boundary of a shape, or the distance around a shape. For example, the perimeter of a rectangle is the sum of its side lengths; the perimeter of a circle is its circumference.

**perpendicular lines.** Two lines in the same plane that intersect at a  $90^\circ$  angle.

**pictograph.** See under **graph**.

**place value.** The value of a digit that appears in a number. The value depends on the position or place in which the digit appears in the number. For example, in the number 5473, the digit 5 is in the thousands place and represents 5000; the digit 7 is in the tens place and represents 70.

**Polydrons.** Commercially produced learning tools that help students learn about the geometric properties, surface areas, and volumes of three-dimensional figures. Polydrons are plastic connecting shapes used to construct three-dimensional figures and their nets.

**polygon.** A closed shape formed by three or more line segments; for example, triangle, quadrilateral, pentagon, octagon.

**polyhedron.** A three-dimensional figure that has polygons as faces.

**population.** The total number of individuals or objects that fit a particular description; for example, salmon in Lake Ontario.

**power.** A number written in exponential form; a shorter way of writing repeated multiplication. For example,  $10^2$  and  $2^6$  are powers. See also **exponential form**.

**Power Polygons.** Commercially produced learning tools that help students learn about shapes and the relationships between their areas. Power Polygons are transparent plastic shapes that include triangles, parallelograms, trapezoids, rectangles, and so on.

**primary data.** Information that is collected directly or first-hand; for example, observations and measurements collected directly by students through surveys and experiments. Also called *first-hand data* or *primary-source data*. See also **secondary data**.

**prime factorization.** An expression showing a composite number as the product of its prime factors. The prime factorization for 24 is  $2 \times 2 \times 2 \times 3$ .

**prime number.** A whole number greater than 1 that has only two factors, itself and 1. For example, the only factors of 7 are 7 and 1. *See also composite number.*

**prism.** A three-dimensional figure with two parallel and congruent bases. A prism is named by the shape of its bases; for example, rectangular prism, triangular prism.

**probability.** A number from 0 to 1 that shows how likely it is that an event will happen.

**product.** *See multiplication.*

**proper fraction.** A fraction whose numerator is smaller than its denominator; for example,  $\frac{2}{3}$ .

**property (geometric).** An attribute that remains the same for a class of objects or shapes. A property of any parallelogram, for example, is that its opposite sides are congruent. *See also attribute.*

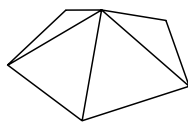
**proportion.** An equation showing equivalent ratios in fraction form; for example,  $\frac{2}{3} = \frac{6}{9}$ .

**proportional reasoning.** Reasoning based on the use of equal ratios.

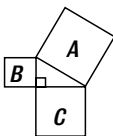
**protractor.** A tool for measuring angles.

**pyramid.** A polyhedron whose base is a polygon and whose other faces are triangles that meet at a common vertex.

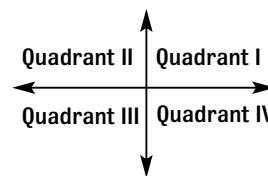
**pentagonal pyramid**



**Pythagorean relationship.** The relationship that, for a right triangle, the area of the square drawn on the hypotenuse is equal to the sum of the areas of the squares drawn on the other two sides. In the diagram,  $A = B + C$ .



**quadrant.** One quarter of the Cartesian plane, bounded by the coordinate axes.



**quadrilateral.** A polygon with four sides.

**radius.** A line segment whose endpoints are the centre of a circle and a point on the circle. The radius is half the diameter.

**range.** The difference between the highest and lowest numbers in a group of numbers or set of data. For example, in the data set 8, 32, 15, 10, the range is 24, that is,  $32 - 8$ .

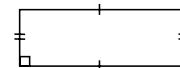
**rate.** A comparison, or a type of ratio, of two measurements with different units, such as distance and time; for example, 100 km/h, 10 kg/m<sup>3</sup>, 20 L/100 km.

**rate of change.** A change in one quantity relative to the change in another quantity. For example, for a 10 km walk completed in 2 h at a steady pace, the rate of change is  $\frac{10 \text{ km}}{2 \text{ h}}$  or 5 km/h.

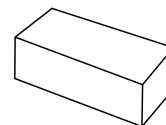
**ratio.** A comparison of quantities with the same units. A ratio can be expressed in ratio form or in fraction form; for example, 3:4 or  $\frac{3}{4}$ .

**rational number.** A number that can be expressed as a fraction in which the denominator is not 0. *See also irrational number.*

**rectangle.** A quadrilateral in which opposite sides are equal, and all interior angles are right angles.



**rectangular prism.** A prism with opposite congruent rectangular faces.

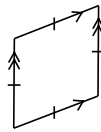


**reflection.** A transformation that flips a shape over an axis to form a congruent shape. A *reflection image* is the mirror image that results from a reflection. Also called *flip*.

**regular polygon.** A closed figure in which all sides are equal and all angles are equal. See also **irregular polygon**.

**relative frequency.** The frequency of a particular outcome or event expressed as a percent of the total number of outcomes. See also **frequency**.

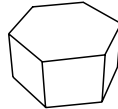
**rhombus.** A parallelogram with equal sides. Sometimes called a *diamond*.



**right angle.** An angle that measures  $90^\circ$ .

**right prism.** A prism whose rectangular faces are perpendicular to its congruent bases.

hexagonal right prism



**rotation.** A transformation that turns a shape about a fixed point to form a congruent shape. A *rotation image* is the result of a rotation. Also called *turn*.

**rotational symmetry.** A geometric property of a shape whose position coincides with its original position after a rotation of less than  $360^\circ$  about its centre. For example, the position of a square coincides with its original position after a  $\frac{1}{4}$  turn, a  $\frac{1}{2}$  turn, and a  $\frac{3}{4}$  turn, as well as after a full turn, so a square has rotational symmetry. See also **order of rotational symmetry**.

**rounding.** See under **estimation strategies**.

**sample.** A representative group chosen from a population and examined in order to make predictions about the population.

**scale (on a graph).** A sequence of numbers associated with marks that subdivide an axis. An appropriate scale is chosen to ensure that all data are represented on the graph.

**scale drawing.** A drawing in which the lengths are proportionally reduced or enlarged from actual lengths.

**scalene triangle.** A triangle with three sides of different lengths.

**scatter plot.** See under **graph**.

**secondary data.** Information that is not collected first-hand; for example, data from a magazine, a newspaper, a government document, or a database. Also called *second-hand data* or *secondary-source data*. See also **primary data**.

**sequence.** A pattern of numbers that are connected by some rule; for example, 3, 5, 7, 9, ...

**shape of data.** The shape of a graph that represents the distribution of a set of data. The shape of data may or may not be symmetrical.

**SI.** The international system of measurement units; for example, centimetre, kilogram. (From the French *Système International d'Unités*.)

**similar.** Having the same shape but not always the same size. If one shape is similar to another shape, there exists a dilatation that will transform the first shape into the second shape.

**simple probability experiment.** An experiment with the same possible outcomes each time it is repeated, but for which no single outcome is predictable; for example, tossing a coin, rolling a number cube.

**simulation.** A probability experiment with the same number of outcomes and corresponding probabilities as the situation it represents. For example, tossing a coin could be a simulation of whether the next person you meet will be a male or a female.

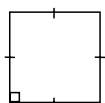
**skeleton.** A model that shows only the edges and vertices of a three-dimensional figure.

**slide.** See **translation**.

**sphere.** A perfectly round ball, such that every point on the surface of the sphere is the same distance from the centre of the sphere.

**spreadsheet.** A tool that helps to organize information using rows and columns.

**square.** A rectangle with four equal sides and four right angles.



**square root of a number.** A factor that, when multiplied by itself, equals the number. For example, 3 is a square root of 9, because  $3 \times 3 = 9$ .

**standard form.** A way of writing a number in which each digit has a place value according to its position in relation to the other digits. For example, 7856 is in standard form. See also **place value**, **expanded form**.

**stem-and-leaf plot.** See *under* **graph**.

**straight angle.** An angle that measures  $180^\circ$ .

**subtraction.** The operation that represents the difference between two numbers. The inverse operation of subtraction is addition.

**supplementary angles.** Two angles whose sum is  $180^\circ$ .

**surface area.** The total area of the surface of a three-dimensional object.

**survey.** A record of observations gathered from a sample of a population. For example, observations may be gathered and recorded by asking people questions or interviewing them.

**symbol.** See *under* **mathematical language**.

**symmetry.** The geometric property of being balanced about a point, a line, or a plane. See also **line of symmetry**, **rotational symmetry**.

**systematic counting.** A process used as a check so that no event or outcome is counted twice.

**table.** An orderly arrangement of facts set out for easy reference; for example, an arrangement of numerical values in vertical columns and horizontal rows.

**tally chart.** A chart that uses tally marks to count data and record frequencies.

**tangram.** A Chinese puzzle made from a square cut into seven pieces: two large triangles, one medium-sized triangle, two small triangles, one square, and one parallelogram.

**ten frame.** A  $2 \times 5$  array in which students place counters or dots to show numbers to 10.

**term.** Each of the quantities constituting a ratio, a sum or difference, or an algebraic expression. For example, in the ratio 3:5, 3 and 5 are both terms; in the algebraic expression  $3x + 2y$ ,  $3x$  and  $2y$  are both terms.

**tessellation.** A tiling pattern in which shapes are fitted together with no gaps or overlaps. A regular tessellation uses congruent shapes. See also **tiling**.

**tetrahedron.** A polyhedron with four faces. A regular tetrahedron is one of the Platonic solids and has faces that are equilateral triangles.

**regular tetrahedron**



**theoretical probability.** A mathematical calculation of the chances that an event will happen in theory; if all outcomes are equally likely, it is calculated as the number of favourable outcomes divided by the total number of possible outcomes.

**tiling.** The process of using repeated shapes, which may or may not be congruent, to cover a region completely. *See also tessellation.*

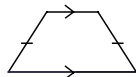
**time line.** A number line on which the numbers represent time values, such as numbers of days, months, or years.

**transformation.** A change in a figure that results in a different position, orientation, or size. The transformations include the *translation* (slide), *reflection* (flip), *rotation* (turn), and *dilatation* (reduction or enlargement). *See also dilatation, reflection, rotation, translation.*

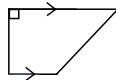
**translation.** A transformation that moves every point on a shape the same distance, in the same direction, to form a congruent shape. A *translation image* is the result of a translation. Also called *slide*.

**trapezoid.** A quadrilateral with one pair of parallel sides.

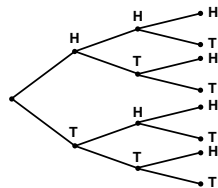
**isosceles trapezoid**



**right trapezoid**



**tree diagram.** A branching diagram that shows all possible combinations or outcomes for two or more independent events. The following tree diagram shows the possible outcomes when three coins are tossed.



**triangle.** A polygon with three sides.

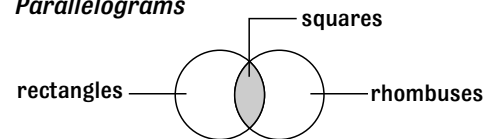
**turn.** *See rotation.*

**unit rate.** A rate that, when expressed as a ratio, has a second term that is one unit. For example, travelling 120 km in 2 h gives a unit rate of 60 km/h or 60 km:1 h.

**variable.** A letter or symbol used to represent an unknown quantity, a changing value, or an unspecified number (e.g.,  $a \times b = b \times a$ ).

**Venn diagram.** A diagram consisting of overlapping and/or nested shapes used to show what two or more sets have and do not have in common.

**Parallelograms**



**vertex.** The common endpoint of the two line segments or rays of an angle. *See also angle.*

**volume.** The amount of space occupied by an object; measured in cubic units, such as cubic centimetres.

**whole number.** Any one of the numbers 0, 1, 2, 3, 4, ...

---

The Ministry of Education wishes to acknowledge the contribution of the many individuals, groups, and organizations that participated in the development and refinement of this curriculum policy document.







Printed on recycled paper

04-163

ISBN 0-7794-8122-4

© Queen's Printer for Ontario, 2005