Diamond shape in maths

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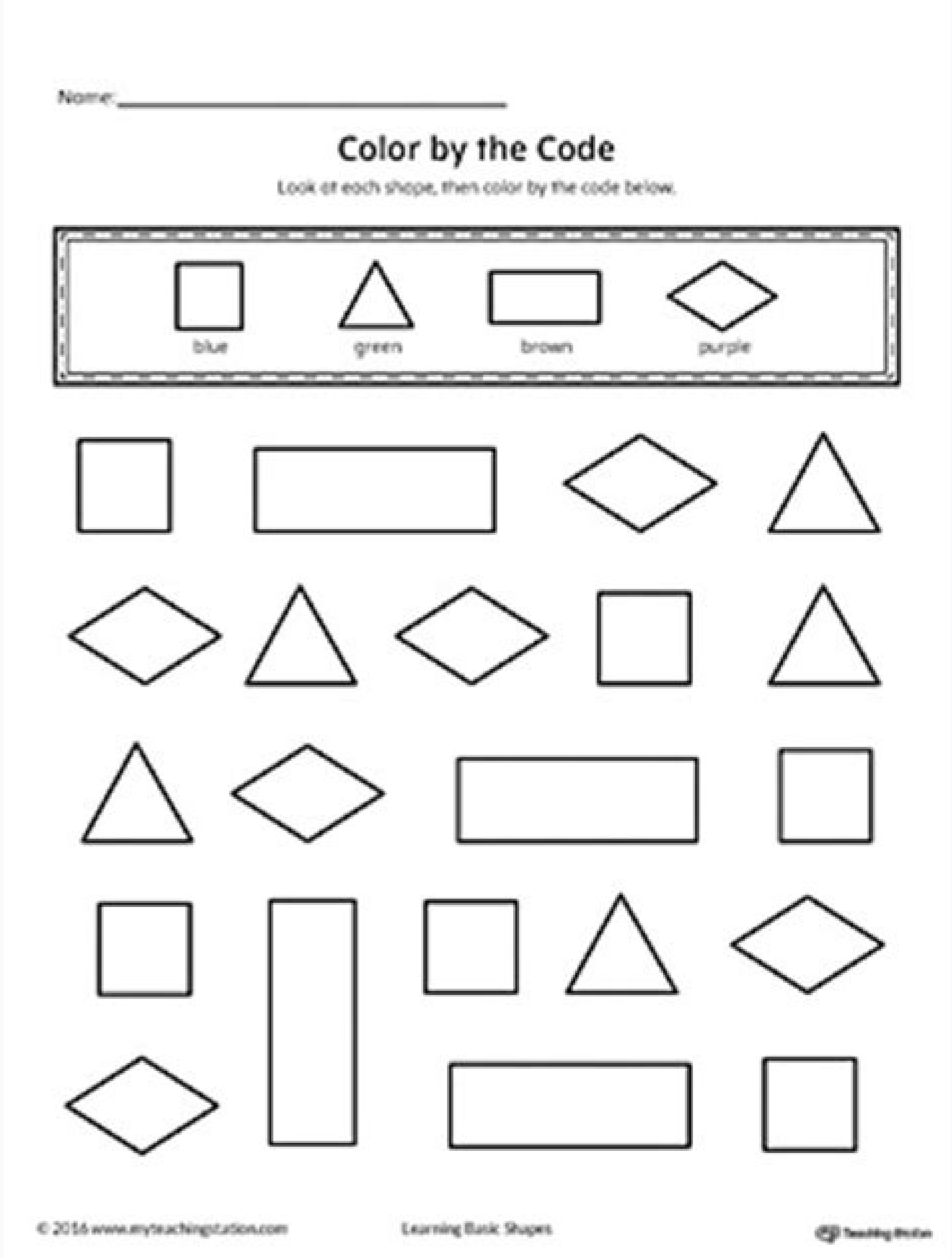
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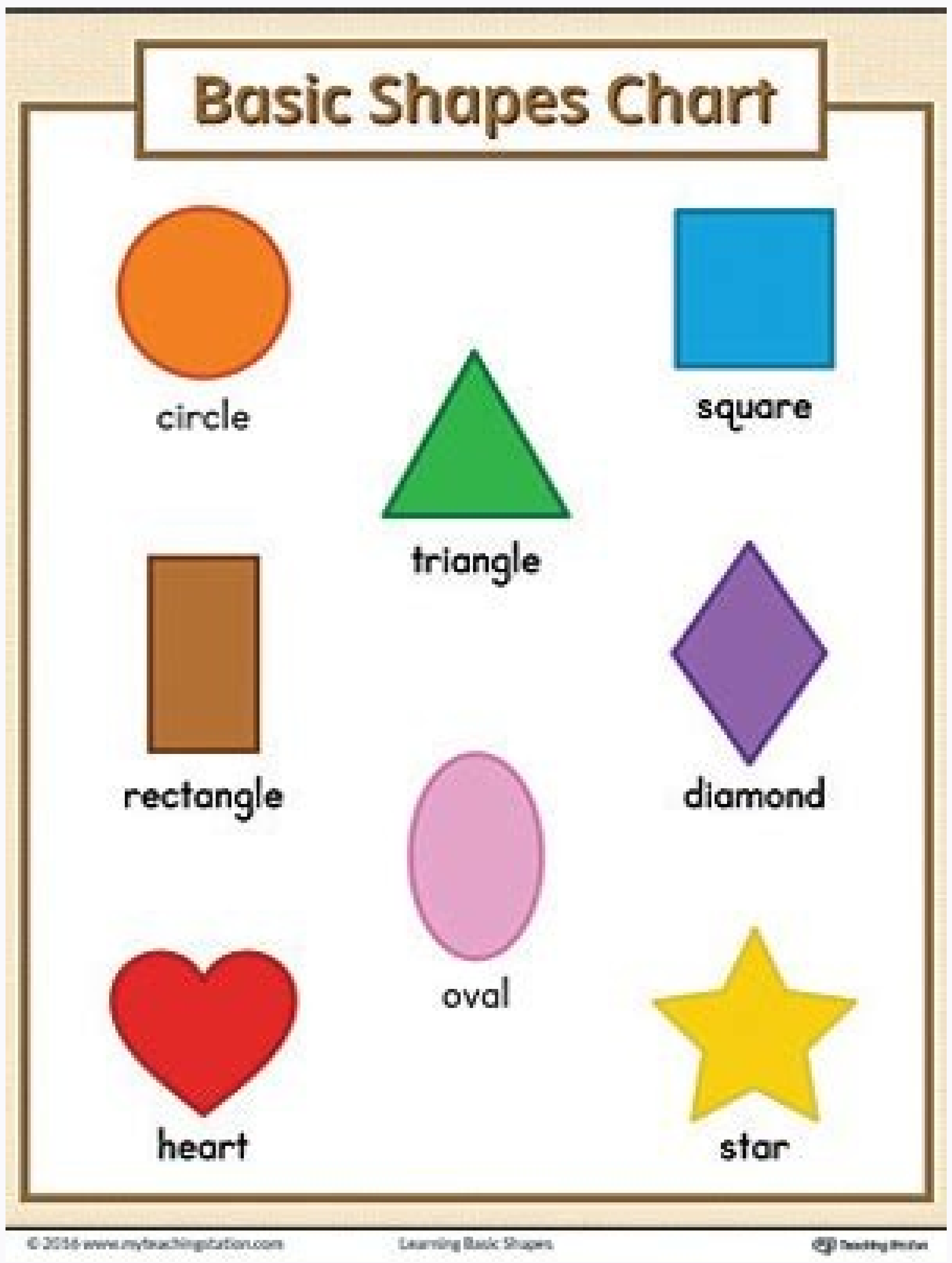
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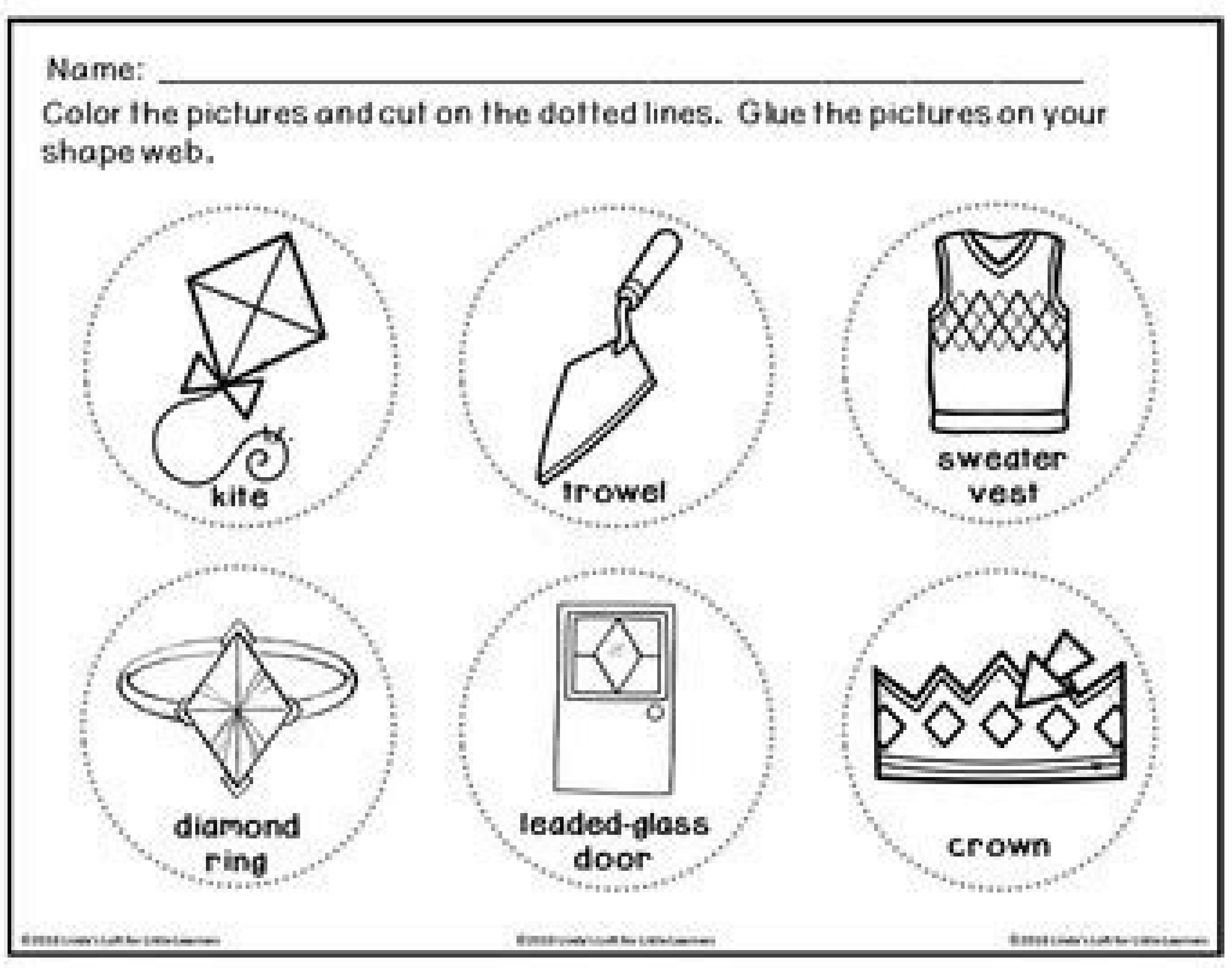
Learning Basic Shapes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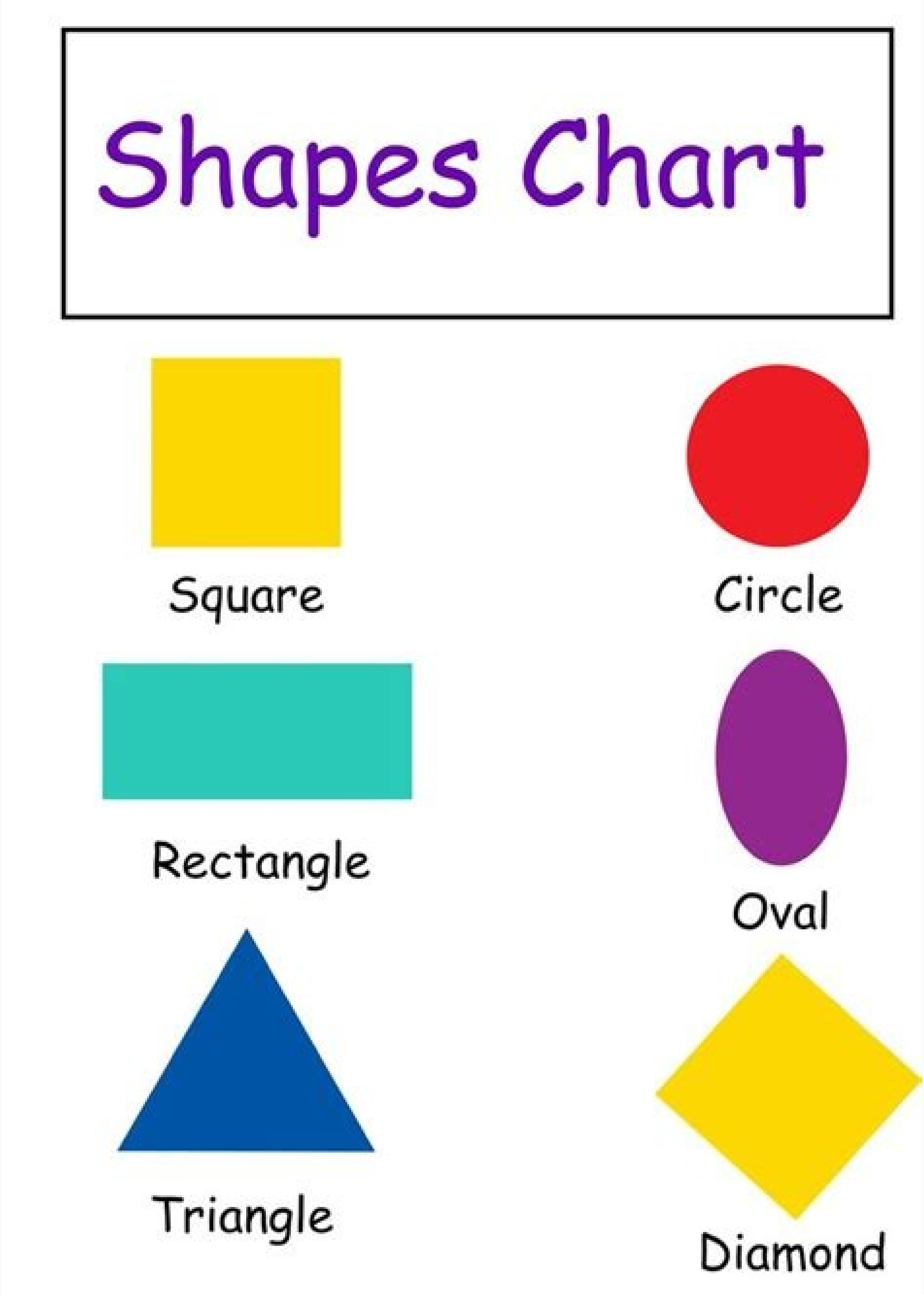

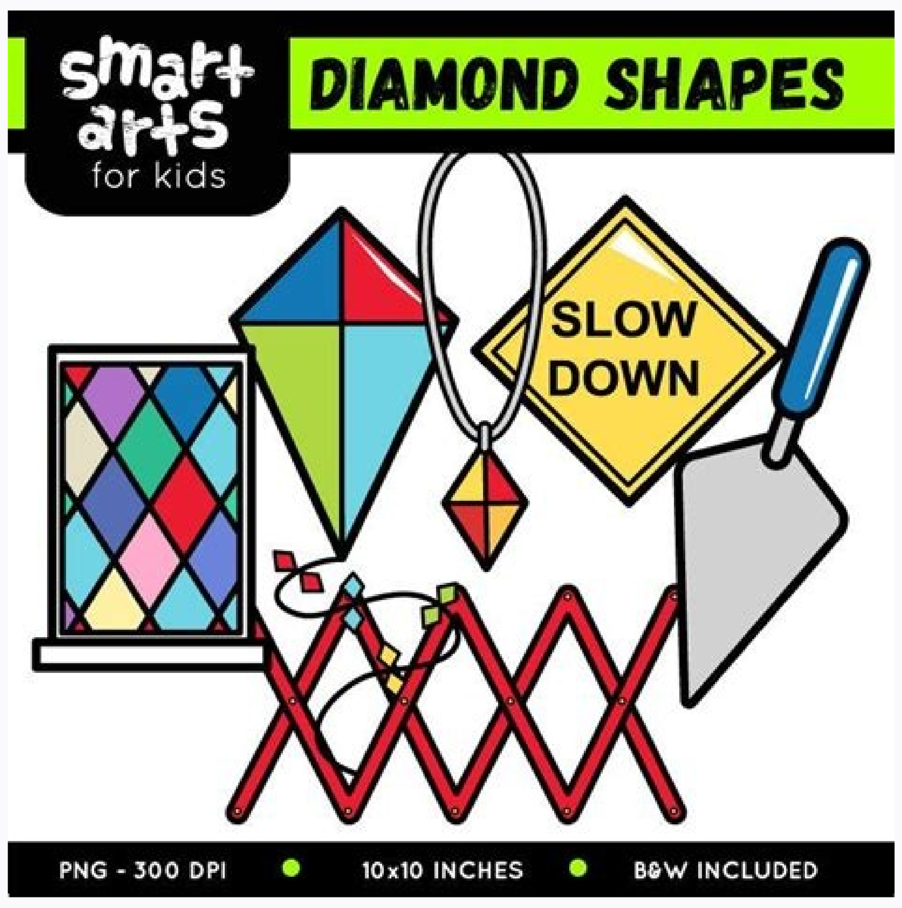

Diamond shape list. Kite for diamond shape in maths. What is a diamond shape called in geometry. Meaning of the diamond shape. What is a diamond in math. What does a diamond shape represent. Diamond shape called in maths.

Every year in 5th grade, when we begin classifying quadrilaterals, students will continually call a rhombus a diamond. It never fails. While doing a Which One Doesn't Belong in 3rd grade yesterday, the same thing happened, so Christopher's tweet came at the most perfect time! (On Desmos here: Of course I had to pop into the same classroom today and try it out! The lower right was so obviously a diamond to me that I was curious to see if students saw the same thing and if it changed their reasoning about the rhombus as a diamond. Here are pictures of the SMARTboard after our talk: After great discussions around number of sides, rotations, decomposition and orientation, they finally got to the naming piece. Honestly, I was surprised names didn't come up as one of the first things. It started with a student saying the square didn't belong because it is the only one that doesn't look like a diamond. The next student said the lower left was the only one "that didn't have a name." When I asked him to explain further, he named the square, rhombus, and diamond. Because I knew at the end of our talk I wanted to ask about the diamond vs rhombus, I wrote the names on the shapes. Another classmate added on and said the lower left "may not have a name but it is kite-shaped and looks like it got stuck in a tree sideways." I asked the class what they thought about the names we had on the board and it was a unanimous agreement on all of them. Funny how quickly they abandoned their idea from yesterday, so I reminded them….they were not getting off the hook that easy;) "Yesterday you were calling this rhombus a diamond, what changed your mind?" Students explained that the lower right actually looks like a real diamond and the rhombus doesn't now that they see them together. "Can we call both of them a diamond?" I asked. I saw a few thinking that may be a great idea. I had them turn and talk to a neighbor while I listened to them. We came back and they seemed to agree we couldn't call them both a diamond because of the number of sides. They were really confident in making the rule that the quadrilateral one had to be a rhombus and the pentagon was the diamond. I pointed to the kite and asked about that one, since it has four sides. "Could we call this a rhombus?" They said no because the sides weren't equal, so not a rhombus. And because it didn't have five sides, not a diamond either. Thank you Christopher! All of these years of trying to settle that rhombus vs diamond debate settled right here with great conversation all around! Next up, this one from Christopher... Answer More...Less... The term diamond is another word for a rhombus. The term is also used to denote a square tilted at a angle. The diamond shape is a special case of the superellipse with parameter , giving it implicit Cartesian equation Since the diamond is a rhombus with diagonals and , it has inradius Writing as an algebraic curve gives the quartic curve which is a diamond curve with the diamond edges extended to infinity. When considered as a polyomino, the diamond of order can be considered as the set of squares whose centers satisfy the inequality . There are then squares in the order- diamond, which is precisely the centered square number of order . For , 2, ..., the first few values are 1, 5, 13, 25, 41, 61, 85, 113, 145, ... (OEIS A001844). The diamond is also the name given to the unique 2-polyiamond. Aztec Diamond, Centered Square Number, Diamond Graph, Kite, Lozenge, Parallelogram, Polyiamond, Quadrilateral, Rhombus, Superellipse, von Neumann Neighborhood Sloane, N. J. A. Sequence A001844/M3826 in "The On-Line Encyclopedia of Integer Sequences." Weisstein, Eric W. "Diamond." From MathWorld--A Wolfram Web Resource. Subject classificationsMore...Less... Quadrilateral in which all sides have the same length For other uses, see Rhombus (disambiguation). RhombusA rhombus in two different orientationsTypequadrilateral, trapezoid, parallelogram, kiteEdges and vertices4Schläfli symbol{ } + { }{2α}Coxeter–Dynkin diagramsSymmetry groupDihedral (D2), [2], (*22), order 4Area K = p · q 2 {\displaystyle K={\frac {p\cdot q}{2}}} (half the product of the diagonals)Propertiesconvex, isotoxal The rhombus has a square as a special case, and is a special case of a kite and parallelogram. In plane Euclidean geometry, a rhombus (plural rhombi or rhombuses) is a quadrilateral whose four sides all have the same length. Another name is equilateral quadrilateral, since equilateral means that all of its sides are equal in length. The rhombus is often called a "diamond", after the diamonds suit in playing cards which resembles the projection of an octahedral diamond, or a lozenge, though the former sometimes refers specifically to a rhombus with a 60° angle (which some authors call a calisson after the French sweet[1] – also see Polyiamond), and the latter sometimes refers specifically to a rhombus with a 45° angle. Every rhombus is simple (non-self-intersecting), and is a special case of a parallelogram and a kite. A rhombus with right angles is a square.[2][3] Etymology The word "rhombus" comes from Ancient Greek: ῥόμβος, romanized: rhombos, meaning something that spins,[4] which derives from the verb ῥέμβω, romanized: rhémbō, meaning "to turn round and round."[5] The word was used both by Euclid and Archimedes, who used the term "solid rhombus" for a bicone, two right circular cones sharing a common base.[6] The surface we refer to as rhombus today is a cross section of the bicone on a plane through the apexes of the two cones. Characterizations A simple (non-self-intersecting) quadrilateral is a rhombus if and only if it is any one of the following:[7][8] a parallelogram in which a diagonal bisects an interior angle a parallelogram in which at least two consecutive sides are equal in length a parallelogram in which the diagonals are perpendicular (an orthodiagonal parallelogram) a quadrilateral with four sides of equal length (by definition) a quadrilateral in which the diagonals are perpendicular and bisect each other a quadrilateral in which each diagonal bisects two opposite interior angles a quadrilateral ABCD possessing a point P in its plane such that the four triangles ABP, BCP, CDP, and DAP are all congruent[9] a quadrilateral ABCD in which the incircles in triangles ABC, BCD, CDA and DAB have a common point[10] Basic properties Every rhombus has two diagonals connecting pairs of opposite vertices, and two pairs of parallel sides. Using congruent triangles, one can prove that the rhombus is symmetric across each of these diagonals. It follows that any rhombus has the following properties: Opposite angles of a rhombus have equal measure. The two diagonals of a rhombus are perpendicular; that is, a rhombus is an orthodiagonal quadrilateral. Its diagonals bisect opposite angles. The first property implies that every rhombus is a parallelogram. A rhombus therefore has all of the properties of a parallelogram: for example, opposite sides are parallel; adjacent angles are supplementary; the two diagonals bisect one another; any line through the midpoint bisects the area; and the sum of the squares of the sides equals the sum of the squares of the diagonals (the parallelogram law). Thus denoting the common side as a and the diagonals as p and q, in every rhombus 4 a 2 = p 2 + q 2 . {\displaystyle \displaystyle 4a^{2}=p^{2}+q^{2}.} Not every parallelogram is a rhombus, though any parallelogram with perpendicular diagonals (the second property) is a rhombus. In general, any quadrilateral with perpendicular diagonals, one of which is a line of symmetry, is a kite. Every rhombus is a kite, and any quadrilateral that is both a kite and parallelogram is a rhombus. A rhombus is a tangential quadrilateral.[11] That is, it has an inscribed circle that is tangent to all four sides. A rhombus. Each angle marked with a black dot is a right angle. The height h is the perpendicular distance between any two non-adjacent sides, which equals the diameter of the circle inscribed. The diagonals of lengths p and q are the red dotted line segments. Diagonals The length of the diagonals p = AC and q = BD can be expressed in terms of the rhombus side a and one vertex angle α as p = a 2 + 2 cos α {\displaystyle p=a{\sqrt {2+2\cos {\alpha }}}} and q = a 2 − 2 cos α . {\displaystyle q=a{\sqrt {2-2\cos {\alpha }}}.} These formulas are a direct consequence of the law of cosines. Inradius The inradius (the radius of a circle inscribed in the rhombus), denoted by r, can be expressed in terms of the diagonals p and q as[11] r = p · q 2 p 2 + q 2 , {\displaystyle r={\frac {p\cdot q}{2{\sqrt {p^{2}+q^{2}}}}},} or in terms of the side length a and any vertex angle α or β as r = a sin α 2 = a sin β 2 . {\displaystyle r={\frac {a\sin \alpha }{2}}={\frac {a\sin \beta }{2}}.} Area As for all parallelograms, the area K of a rhombus is the product of its base and its height (h). The base is simply any side length a: K = a · h . {\displaystyle K=a\cdot h.} The area can also be expressed as the base squared times the sine of any angle: K = a 2 · sin α = a 2 · sin β , {\displaystyle K=a^{2}\cdot \sin \alpha =a^{2}\cdot \sin \beta ,} or in terms of the height and a vertex angle: K = h 2 sin α , {\displaystyle K={\frac {h^{2}}{\sin \alpha }},} or as half the product of the diagonals p, q: K = p · q 2 , {\displaystyle K={\frac {p\cdot q}{2}},} or as the semiperimeter times the radius of the circle inscribed in the rhombus (inradius): K = 2 a · r . {\displaystyle K=2a\cdot r.} Another way, in common with parallelograms, is to consider two adjacent sides as vectors, forming a bivector, so the area is the magnitude of the bivector (the magnitude of the vector product of the two vectors), which is the determinant of the two vectors' Cartesian coordinates: K = x1y2 – x2y1.[12] Dual properties The dual polygon of a rhombus is a rectangle:[13] A rhombus has all sides equal, while a rectangle has all angles equal. A rhombus has opposite angles equal, while a rectangle has opposite sides equal. A rhombus has an inscribed circle, while a rectangle has a circumcircle. A rhombus has an axis of symmetry through each pair of opposite vertex angles, while a rectangle has an axis of symmetry through each pair of opposite sides. The diagonals of a rhombus intersect at equal angles, while the diagonals of a rectangle are equal in length. The figure formed by joining the midpoints of the sides of a rhombus is a rectangle, and vice versa. Cartesian equation The sides of a rhombus centered at the origin, with diagonals each falling on an axis, consist of all points (x, y) satisfying | x a | + | y b | = 1. {\displaystyle \left|{\frac {x}{a}}\right|\!+\left|{\frac {y}{b}}\right|\!=1.} The vertices are at (± a , 0) {\displaystyle (\pm a,0)} and (0 , ± b) . {\displaystyle (0,\pm b).} This is a special case of the superellipse, with exponent 1. Other properties One of the five 2D lattice types is the rhombic lattice, also called centered rectangular lattice. Identical rhombi can tile the 2D plane in three different ways, including, for the 60° rhombus, the rhombille tiling. As topological square tilings As 30-60 degree rhombille tiling Three-dimensional analogues of a rhombus include the bipyramid and the bicone. Several polyhedra have rhombic faces, such as the rhombic dodecahedron and the trapezo-rhombic dodecahedron. Some polyhedra with all rhombic faces Isohedral polyhedra Not isohedral polyhedra Identical rhombi Identical golden rhombi Two types of rhombi Three types of rhombi Rhombic dodecahedron Rhombic triacontahedron Rhombic icosahedron Rhombic enneacontahedron Rhombohedron As the faces of a polyhedron A rhombohedron (also called a rhombic hexahedron) is a three-dimensional figure like a cuboid (also called a rectangular parallelepiped), except that its 3 pairs of parallel faces are up to 3 types of rhombi instead of rectangles. The rhombic dodecahedron is a convex polyhedron with 12 congruent rhombi as its faces. The rhombic triacontahedron is a convex polyhedron with 30 golden rhombi (rhombi whose diagonals are in the golden ratio) as its faces. The great rhombic triacontahedron is a nonconvex isohedral, isotoxal polyhedron with 30 intersecting rhombic faces. The rhombic hexecontahedron is a stellation of the rhombic triacontahedron. It is nonconvex with 60 golden rhombic faces with icosahedral symmetry. The rhombic enneacontahedron is a polyhedron composed of 90 rhombic faces, with three, five, or six rhombi meeting at each vertex. It has 60 broad rhombi and 30 slim ones. The trapezo-rhombic dodecahedron is a convex polyhedron with 6 rhombic and 6 trapezoidal faces. The rhombic icosahedron is a polyhedron composed of 20 rhombic faces, of which three, four, or five meet at each vertex. It has 10 faces on the polar axis with 10 faces following the equator. See also Merkel-Raute Rhombus of Michaelis, in human anatomy Rhomboid, either a parallelepiped or a parallelogram that is neither a rhombus nor a rectangle Rhombic antenna Rhombic Chess Flag of the Department of North Santander of Colombia, containing four stars in the shape of a rhombus Superellipse (includes a rhombus with rounded corners) References ^ Alsina, Claudi; Nelsen, Roger B. (31 December 2015). 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