



This is an example of a “road map” for classifying quadrilaterals. This is one path or way of helping students understand the learning target for the classification of quadrilaterals, leading to the classification of two-dimensional figures. The paths may differ or include a different progression of steps.

In order for students to be able to classify different types of quadrilaterals, students must be able to first describe the properties of polygons. They must understand that polygons are closed figures with straight sides and that for every polygon, the number of its sides is equal to the number of its angles. Once students have this understanding, they can begin classifying quadrilaterals based on the fact that they all have four sides, four vertices, and four angles. To further classify quadrilaterals, students need to be able to identify parallel lines. This allows them to separate quadrilaterals into shapes that have two sets of parallel sides (parallelograms), one set of parallel sides (trapezoid), and 0 sets of parallel sides (kites, etc). In order to classify the different types of parallelograms, students must be able to recognize right angles to distinguish how rectangles and squares are special types of parallelograms. Finally, it is important for students to recognize congruent sides. This helps students to classify squares as a special type of rectangle. Through this progression of learning targets, students will be equipped to classify quadrilaterals and ultimately master the intended learning goal of classifying two-dimensional shapes.

## Learning Targets: Assessing a Range of Students' Abilities

Learning Target	Meaning	Examples
Mathematics Facts	Knowing conventions and correct terms for concepts	<ul style="list-style-type: none"> <li>▪ Knowing addition facts</li> <li>▪ Knowing the names of polygons with 3, 4, 5 sides</li> <li>▪ Knowing that the name given to the point (0, 0) is origin</li> <li>▪ Remembering that (2, 3) indicates the point on a graph that is two units to the right of the y-axis and three units above the x-axis</li> </ul>
Mathematics Skills and Processes	Knowing how to carry through standard procedures	<ul style="list-style-type: none"> <li>▪ Solving an addition problem with three addends quickly and accurately</li> <li>▪ Following rules for measuring length with a ruler</li> </ul>
Mathematics Concepts	Concepts we want students to know; Understanding the meaning of mathematics concepts and how they relate to each other	<ul style="list-style-type: none"> <li>▪ Interpreting a graph and using the range of the set to describe the data</li> <li>▪ Understanding that the two sides of a number sentence should represent the same value and explaining why <math>2 + 3 = 4 + 1</math></li> <li>▪ Generalizing and extending a pattern</li> </ul>
Mathematical Reasoning and Proof	Using knowledge to reason and solve problems	<ul style="list-style-type: none"> <li>▪ Prove that a square is a rectangle</li> <li>▪ Knowing which operation to use in a problem and justifying why the answer is reasonable</li> </ul>

Mathematical Strategies, Problem Solving and Application	Being able to approach problems and use techniques and strategies to solve problems	<ul style="list-style-type: none"> <li>▪ Classify quadrilaterals by a rule or common property</li> <li>▪ Develop strategies for solving for the variable in an equation</li> <li>▪ Take one strategy and apply it to multiple problem solving contexts</li> </ul>
Personal Attitudes, Confidence and Competence	Develop a positive orientation toward the subject; becoming more confident, creative, cooperative, committed, and able to work as a team	<ul style="list-style-type: none"> <li>▪ Students cooperate and work as a team to classify and sort polygons, lines, angles, and quadrilaterals</li> <li>▪ Students gain confidence in their problem solving abilities by sharing and discussing various strategies in class</li> <li>▪ Students continue working on challenging problems and are committed to finding a solution rather than giving up quickly or quitting</li> <li>▪ Students enjoy math and see themselves as mathematicians</li> </ul>

### Bloom's Revised Taxonomy

Factual Knowledge	<ul style="list-style-type: none"> <li>▪ Basic elements that students must know in order to solve problems in the discipline</li> <li>▪ Knowledge of terminology</li> <li>▪ Knowledge of specific details and elements</li> </ul>
Conceptual Knowledge	<ul style="list-style-type: none"> <li>▪ Knowledge of the inter-relationships of the basic elements of the discipline and how they fit the larger structure</li> <li>▪ Knowledge of classifications, principles, and generalizations, models and structures, and theories</li> </ul>
Procedural Knowledge	<ul style="list-style-type: none"> <li>▪ How to do something - inquiry, algorithms, techniques and methods</li> <li>▪ Knowledge of subject specific skills and use of algorithms</li> <li>▪ Knowledge of criteria for determining appropriate procedures</li> </ul>
Metacognitive Knowledge	<ul style="list-style-type: none"> <li>▪ Knowledge of the process of thoughts and awareness of one's own cognition</li> <li>▪ Strategic knowledge</li> <li>▪ Self-knowledge</li> </ul>