

Quadrilateral Families



Grade 5 | NC.5.G.3

Teacher scripts • Original visual models
30 choice + 30 open/performance tasks
Student organizers • Worked keys • Evidence record

Current NC standards for 2026-27 and 2027-28. Use selected tasks across several sessions; the bank is not a single test.

Free sample | Contents

NC.5.G.3 | Fifth Grade mathematics

This sample contains 19 complete selected pages from the 92-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-15, 30-31, 60, 75

Representative activities

M01: sample PDF page(s) 16; original page(s) 15

M02: sample PDF page(s) 16; original page(s) 15

O01: sample PDF page(s) 17; original page(s) 30

O02: sample PDF page(s) 18; original page(s) 31

Selected teacher prompts and keys: original page(s) 60, 75

Using this sample

Read the preparation and access guidance before using a selected activity.

Keep teacher keys and private preparation pages separate from student copies.

Use the original resource contents to see the scope of the complete packet.

Complete paid download

The complete resource includes the full PDF task bank and teaching materials.

TEACHER GUIDE

Standard and targets

Classify quadrilaterals into categories based on their properties.

- Explain that attributes belonging to a category of quadrilaterals also belong to all subcategories of that category.
- Classify quadrilaterals in a hierarchy based on properties.

I can...

- Classify quadrilaterals by parallel sides, equal sides and right angles.
- Explain why a subcategory inherits all properties of its parent category.
- Construct a hierarchy, including squares in both rectangles and rhombuses.

Essential question: How do the properties of a model justify its measurement or classification? Mathematical practices: MP2 connects quantities and symbols; MP3 explains and critiques; MP5 selects tools; MP7 uses structure.

TEACHER GUIDE

Plan and coverage

Use four sessions of about 25-35 minutes: 1, warm-up and I Do; 2, We Do and collaborative practice; 3, independent work; 4, reteach and exit. Select one choice and one open task per section initially; save remaining tasks for spaced practice or individual conferences.

Seven sections allocate the bank as follows. Task targets and worked solutions are printed in the teacher keys. Actual construction and classification evidence cannot be inferred from choice items.

Warm-up: M01-M04 and O01-O04

I Do: M05-M08 and O05-O08

We Do: M09-M13 and O09-O13

Collaborative practice: M14-M18 and O14-O18

Independent practice: M19-M23 and O19-O23

Small-group reteach: M24-M27 and O24-O27

Exit ticket: M28-M30 and O28-O30

Navigation: guide and model -> seven scripts -> choice bank -> open/performance bank -> teacher keys -> scoring and evidence -> sources. Print only selected student pages and keep worked references out of view for independent checks.

TEACHER GUIDE

Materials and access

Prerequisites: recognize polygons and right angles; compare equal lengths and parallel sides; explain a property rather than a visual resemblance.

Materials: pencil, supplied organizers, ruler and optional right-angle corner tool.

Neutral read-aloud, enlarged pages, AAC, signing, dictated explanations and breaks are access supports. Record them separately. Do not score handwriting, accent or reading skill.

Answer-supplying cues include announcing a layer subtotal or formula step, naming a category, drawing a completed hierarchy or marking a defining property for the learner. Record the original response before giving such instruction.

Vocabulary: polygon, quadrilateral, parallel, perpendicular, right angle, rectangle, rhombus, square, trapezoid, hierarchy, subcategory.

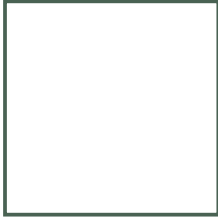
Observe each learner individually before partner comparison. N/O means inaccessible, unobserved or insufficient evidence, not an incorrect response. No fixed speed cutoffs or official mastery claims are used.

All figures are original and illustrative. Printed lengths are not intended for ruler measurement; use stated dimensions/properties. For construction, students verify their own lengths and angles.

WORKED TEACHER MODEL

Model the structure

A square has four equal sides AND four right angles.



Square



Non-square rectangle

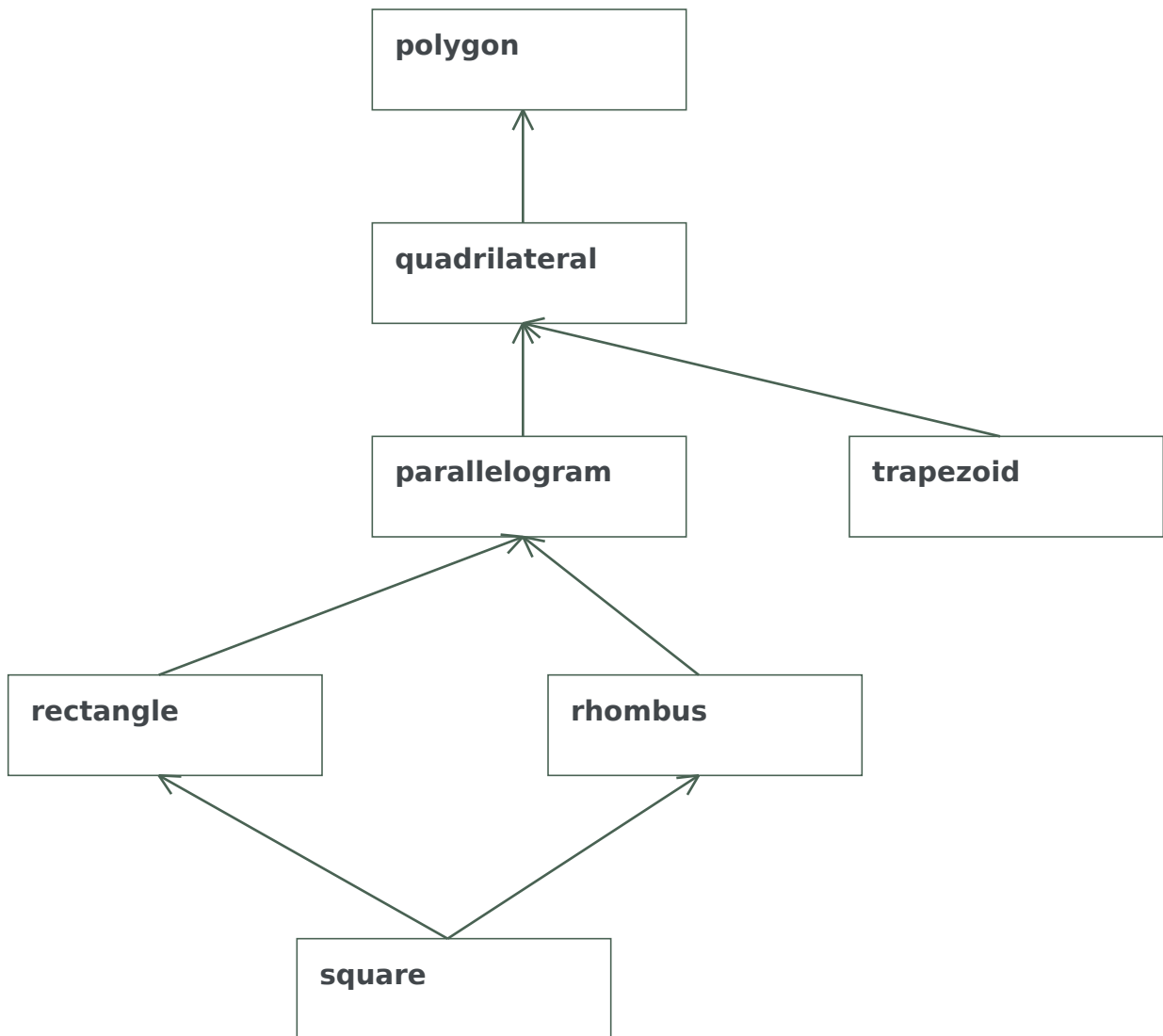
A square belongs to both rectangles and rhombuses. Each is a kind of parallelogram, hence a quadrilateral and a polygon. A 6-by-3 rectangle shows why the reverse claim fails: its adjacent sides are unequal.

NC uses the exclusive definition: a trapezoid has EXACTLY ONE pair of parallel sides. It cannot be a parallelogram, which has two pairs. Do not infer equal sides from a drawing alone; use stated properties or check the construction.

STUDENT REFERENCE - SHARED PRACTICE

Family map

An arrow points from a smaller family to a containing family. This is a partial map, not a list of every polygon family.



Square inherits four right angles from rectangle and four equal sides from rhombus. Keep this reference out of view during independent hierarchy checks.

STUDENT TOOL

Reusable organizer

Name: _____ Date: _____

Draw your figures and connect categories. State what your arrows mean.

Figure A / defining properties**Figure B / defining properties****Hierarchy: categories and arrows****Inherited property / example or counterexample**

TEACHER GUIDE

Warm-up script

Core selection: M01 and O01. Optional bank: through M04/O04. Adjust time to evidence, not speed.

1-3 minutes | Launch

Show a rotated square and a long rectangle. Ask: "Which properties matter even when a shape turns?" Listen for sides, parallelism and angles rather than size or orientation.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Construct a hierarchy, including squares in both rectangles and rhombuses. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

TEACHER GUIDE

I Do script

Core selection: M05 and O05. Optional bank: through M08/O08. Adjust time to evidence, not speed.

1-3 minutes | Launch

Say: "A square has four right angles, so it is a rectangle. It also has four equal sides, so it is a rhombus. Both families sit inside parallelograms." Draw two arrows upward from square.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Construct a hierarchy, including squares in both rectangles and rhombuses. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

TEACHER GUIDE

We Do script

Core selection: M09 and O09. Optional bank: through M13/O13. Adjust time to evidence, not speed.

1-3 minutes | Launch

Compare a 6-by-3 rectangle and a square. Ask why all squares are rectangles but not all rectangles are squares. Use the long rectangle as a counterexample, not a vote.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Explain why a subcategory inherits all properties of its parent category. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

TEACHER GUIDE

Collaborative practice script

Core selection: M14 and O14. Optional bank: through M18/O18. Adjust time to evidence, not speed.

1-3 minutes | Launch

Partners draw examples, then classify them independently before discussion. Each must justify every included family and one excluded family using a property.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Classify quadrilaterals by parallel sides, equal sides and right angles. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

TEACHER GUIDE

Independent practice script

Core selection: M19 and O19. Optional bank: through M23/O23. Adjust time to evidence, not speed.

1-3 minutes | Launch

Use a fresh orientation and written property description. Ask for the full hierarchy; do not provide the parent name or point toward the correct branch.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Explain why a subcategory inherits all properties of its parent category. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

TEACHER GUIDE

Small-group reteach script

Core selection: M24 and O24. Optional bank: through M27/O27. Adjust time to evidence, not speed.

1-3 minutes | Launch

If learners treat categories as exclusive, place a square at the intersection of rectangles and rhombuses. Contrast NC trapezoids: exactly one parallel pair means they are outside parallelograms.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Explain why a subcategory inherits all properties of its parent category. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

TEACHER GUIDE

Exit ticket script

Core selection: M28 and O28. Optional bank: through M30/O30. Adjust time to evidence, not speed.

1-3 minutes | Launch

Ask each learner to draw an example, connect it to its parent families and explain one inherited property. Record classification and justification separately.

4-8 minutes | Model or elicit

During I Do, use the worked example and demonstrate the complete solution. During We Do, pause for each next step. For independent and exit tasks, keep the explanation neutral. Use the open task first when collecting performance evidence.

3-6 minutes | Examine

Listen for: Explain why a subcategory inherits all properties of its parent category. Ask: "What in your model proves that? How can you check it another way?" Do not supply a category or subtotal.

2-4 minutes | Respond

After documenting the first response, revisit the model or organizer. A prototype-based answer needs a rotated example and property check; a reversed inclusion needs a counterexample.

1-3 minutes | Close

Ask for a different example and an explanation of what stays true. Record the exact response, access support, any mathematical cue and a fresh item for a later check. Early finishers invent a valid challenge and explain why their key is unique.

STUDENT BANK

Choice practice 1-2

M01 A figure has exactly one pair of parallel sides. Which complete list of its categories is correct?

- A. polygon, quadrilateral, parallelogram, rhombus
- B. polygon, quadrilateral
- C. polygon, quadrilateral, parallelogram
- D. polygon, quadrilateral, trapezoid

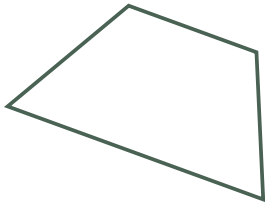
M02 Which property belongs to EVERY polygon, so every quadrilateral inherits it?

- A. four equal sides
- B. a closed boundary made of straight segments
- C. four right angles
- D. a curved boundary

STUDENT PERFORMANCE

001 | Warm-up

Build a hierarchy using polygon, quadrilateral, parallelogram, rectangle, rhombus, square and trapezoid. Draw arrows and state what an arrow means. Explain two inherited properties of squares and why trapezoids form a separate branch. Add an example to each category. For your detailed example, use a trapezoid with exactly one pair of parallel sides.



Use the stated properties; drawings are illustrative.

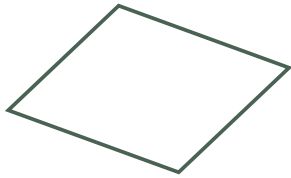
Draw / classify / show arrows or counterexamples

Explain properties and category relationships

STUDENT PERFORMANCE

002 | Warm-up

Figure 14 has two pairs of parallel sides, unequal adjacent sides and no right angles. List **ALL** its categories from polygon, quadrilateral, parallelogram, rectangle, rhombus, square and trapezoid. Explain each inclusion and one exclusion. Draw arrows to show its parent categories.



Use the stated properties; drawings are illustrative.

Draw / classify / show arrows or counterexamples

Explain properties and category relationships

TEACHER ONLY

M worked keys 1-2

M01: D. polygon, quadrilateral, trapezoid

Target: Classify quadrilaterals by parallel sides, equal sides and right angles.

Apply each definition to exactly one pair of parallel sides: polygon, quadrilateral, trapezoid. Smaller categories retain every parent category.

Distractor checks: polygon, quadrilateral, parallelogram, rhombus: Fails the requested defining property, complete list or category relationship. Compare with the property-based proof above. polygon, quadrilateral: Fails the requested defining property, complete list or category relationship. Compare with the property-based proof above. polygon, quadrilateral, parallelogram: Fails the requested defining property, complete list or category relationship. Compare with the property-based proof above. Ask for reasoning before assigning a misconception.

M02: B. a closed boundary made of straight segments

Target: Explain why a subcategory inherits all properties of its parent category.

a closed boundary made of straight segments is a property of every polygon. A quadrilateral belongs to that parent category, so it must retain the property. The other choices are not required of all members of the parent.

Distractor checks: four equal sides: Fails the requested defining property, complete list or category relationship. Compare with the property-based proof above. four right angles: Fails the requested defining property, complete list or category relationship. Compare with the property-based proof above. a curved boundary: Fails the requested defining property, complete list or category relationship. Compare with the property-based proof above. Ask for reasoning before assigning a misconception.

TEACHER ONLY

O worked keys 1-2

001: Inclusive square hierarchy; exclusive trapezoid branch

Target: Construct a hierarchy, including squares in both rectangles and rhombuses.

Using arrows meaning "is a kind of": square $\rightarrow$ rectangle and square $\rightarrow$ rhombus; rectangle $\rightarrow$ parallelogram and rhombus $\rightarrow$ parallelogram; parallelogram $\rightarrow$ quadrilateral; trapezoid $\rightarrow$ quadrilateral; quadrilateral $\rightarrow$ polygon. Square inherits four right angles from rectangle and four equal sides from rhombus. Trapezoids have exactly one parallel pair. Examples: square; 6-by-3 rectangle; non-square rhombus; slanted non-rhombus parallelogram; exclusive trapezoid; irregular quadrilateral; triangle for polygon. The chart need not list every polygon family. Detailed example families: polygon, quadrilateral, trapezoid.

Accept equivalent correct drawings, equations and explanations. For construction tasks, record the observed build separately; a correct written answer alone does not establish the performance.

002: polygon, quadrilateral, parallelogram

Target: Explain why a subcategory inherits all properties of its parent category.

Include polygon, quadrilateral, parallelogram. Definition evidence: two pairs of parallel sides, unequal adjacent sides and no right angles. Exclude trapezoid: it has two parallel pairs, not exactly one. Arrows may point from each smaller family toward its containing parent. State arrow meaning.

Accept equivalent correct drawings, equations and explanations. For construction tasks, record the observed build separately; a correct written answer alone does not establish the performance.