

GRADE 5 • GEOMETRY

CLASSIFYING FIGURES IN A HIERARCHY

Today's goal: I can understand that attributes of a category of figures belong to all subcategories and classify two-dimensional figures in a hierarchy based on properties.



Tan



Digit



Blaze



Pi



Most classes say no

- 1 Squares and rectangles are two different shapes.
- 2 They have two different pictures.

TURN & TALK

That is a LIST. Lists have no members inside members.



Ask the requirements

- 1 A rectangle needs: 4 sides, 4 right angles, 2 pairs of parallel sides.
- 2 Does a square have all three?

REMEMBER

Yes. So a square IS a rectangle.



WATCH OUT!

Not the other way

- 1 A square also needs all sides equal.
- 2 A 2-by-5 rectangle does not have that.

DON'T FALL FOR IT

EVERY square is a rectangle. SOME rectangles are squares.



The free part

1 All rectangles have 4 right angles.

2 Every square is a rectangle.

REMEMBER

So squares have 4 right angles. Nothing new to learn.



WATCH OUT!

Not a single chain

1 A rectangle is not a rhombus. A rhombus is not a rectangle.

2 A square is BOTH.

DON'T FALL FOR IT

The square is where the two overlap.



BIG IDEA 5

Turning it changes nothing

- 1 Rotate a square 45° . Still 4 equal sides, 4 right angles.

REMEMBER

“Diamond” is not a property. Orientation never is.



Something went wrong here...

THE PROBLEM

Answer both ways: is every square a rhombus? Is every rhombus a square?

WHAT A STUDENT DID

Answered yes to both, having accepted the first direction and generalised. The second question is a different question, and it needs its own check.

YOUR MISSION

What went wrong? What's the right answer?



Answer both ways: is every square a rhombus? Is every rhombus a square?

- 1 Rhombus requires: 4 sides, 2 pairs of parallel sides, all sides equal. A square has all three — so yes.
- 2 Square additionally requires 4 right angles, which a rhombus need not have.
- 3 So a rhombus leaning over, with no right angles, is a rhombus and not a square.

Answer: yes; no



Pick your pepper!

**1 MILD**

Answer yes or no, with the requirements you checked: is every square a rectangle? Is every rectangle a square?

#1 on your practice sheet

**2 MEDIUM**

Is every rectangle a rhombus? Is every rhombus a rectangle?
Draw an example for each answer.

#2 on your practice sheet

**3 SPICY**

Which single shape is both a rectangle and a rhombus? Explain using requirements.

#4 on your practice sheet

How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Step-by-step videos on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

