Understanding and Connecting

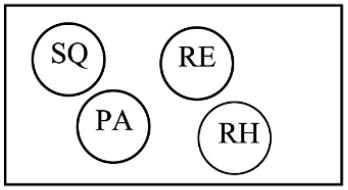
Shape

Scavenger Shape Hunt

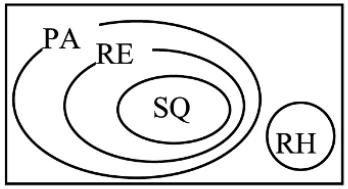
Teacher-Student Conferencing

Pre-reading Task

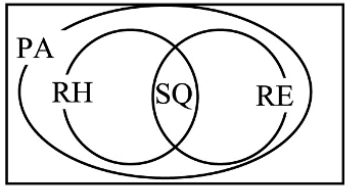
Three students have drawn the following Venn diagrams showing the relationships between four quadrilaterals:
Rectangles (RE), Parallelograms (PA), Rhombuses (RH), and Squares (SQ).



[Tian]



[Rini]



[Mia]

Which student's diagram is correct?

Check one box

A. Tian ❑

B. Rini ❑

C. Mia ❑

Reference: Teacher Education Study in Mathematics (TEDS-M) 2008

Released Items
Future Teacher Mathematics Content Knowledge (MCK) and Mathematics Pedagogical Content Knowledge (MPCK) - Primary
Prepared by: Australian Council for Educational Research for the TEDS-M International Study Center (Michigan State University, East Lansing, USA)

Read the story of Shapestown with your students and answer the question afterwards. You might like to ask your own questions based on the story. These can be aligned with the progression continuum below.

h **The learner**	**i** **The learner**	**j** **The learner**	**k** **The learner**
Compares and classifies 2-D geometric shapes, including quadrilaterals and triangles, based on their properties [regular/ irregular; acute, obtuse, or reflex angles; parallel and perpendicular, lines; symmetry].	Explores and identifies the properties of the circle. Construct and measure angles of different types of triangles. Investigates the sum of the angles in a triangle. Explores the positions and types of angles [internal and external]] in shapes.	Writes minimal defining lists to define shapes. Understands connections between classes of shapes (For example: all squares are rectangles; some rectangles are squares).	Investigates the sum of the angles in quadrilaterals. Describes the properties of shapes and explains how unknown angles and lengths can be derived from known measurement(s).

https://www.curriculumonline.ie/getmedia/89480cbe-f3cb-4510-bfd0-d20801e6127f/PMC_PC14_ShapeandSpace_Shape.pdf

Shapestown

Story written as part of a Fighting Words workshop with preservice primary teacher in Dublin City University 2023

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There was once a town where all the shapes lived. It was called Shapestown. Many 2D shapes lived there, each having their own street. The triangles lived on Triangle Street, the squares lived on Square Street, and the circles lived on Circle Street. But Poly didn't have anywhere to live.

Poly is a purple kite. Her mum was a square and her dad was a triangle and so Poly ended up as a kite. Having grown up with squares, she has always felt that she stuck out.

Everyday Poly wakes up and begins her regular workout in the hope of making her shape regular. She does ten jumping jacks, ten squats, and ten minutes of dance. Despite all this, her shape remains the same.

One day, during her dance routine, everything was going to plan until she fell over her dancing Lego Robot, and one of her long sides got pushed in. In desperation she exclaimed, “I am even more irregular now”. She hopped on one corner to her best friend’s Bobby’s house, who lived on Circle Street, to see if he could help. Bobby understood how Poly felt as he was an oval.

Bobby exclaimed when he saw her. “Poly, is that you? You look kind of weird and more irregular than usual.”

Poly burst out crying. Straight tears ran in parallel lines down her face. “I fell on my dancing Lego robot that I had designed to help me with regular exercise in the hope that it would make me more regular. Please help. Can you try to push me back into shape?”

Bobby agreed to help. First, he pulled and pulled, but her angles were either too acute or too obtuse, they just weren’t RIGHT! Then he pushed and pushed but her sides were too short or too long, they just weren’t EQUAL! They were about to give up, when Bobby thought, “Don’t worry I know a shapeshifter who lives on Dodgy Lane!” We’ll head over there.”

They turned a corner and went around a bend and arrived at the shapeshifter's lab. Poly was hesitant. "This all seems a bit irregular to me," she said. However, Poly was curious so she did jumping-jacks in.

Dr Transformation appeared at the door. "Welcome to my lab, how can I help you?"

"I heard you can help me to become a regular shape. I am sick of being misidentified."

Dr Transformation obliged and cast the magic spell "Irregularis circumferenco, perpendicularo, rotationlatis." "Success' 'Dr. Transformation beamed. "You are a regular shape now." Poly was thrilled.

Poly and Bobby made their way back to Square Street. On the way she saw her reflection in the window of a shop on Dodgyville. She started crying straight, parallel tears again. "I am not a regular shape, Bobby, look at me!" Poly saw a purple rhombus in the window and she could not believe the Doctor had lied to her.

As she was looking in the window's reflection, she saw a square in the distance. The square was rotated and balancing on one of his corners. Suddenly, she saw how herself and the square were related.

"I know," said Poly. "Let's make a new street and we'll call it Quadrilateral Street, where all the quadrilaterals can live together, regular and irregular."

For the first time ever, Poly finally felt like she fitted in and she lived happily ever.

Teacher-Student Conferencing

Post-reading Questions

Can you explain why Poly was still upset after she was transformed into a rhombus?

Using Venn diagrams, can you draw a map of Shapestown? Identify where Poly and Bobby might live.