Mystery Quadrilateral!

by – Steve Phelps

Activity overview

This activity could be used as an assessment after a unit on special quadrilateral. Students are given an unknown mystery quadrilateral that looks like a square. By dragging the vertices of the mystery quadrilateral, students conjecture the true name of the quadrilateral. Students support their conjecture by taking appropriate measurements to support their conjectures.

Concepts

Special Quadrilaterals (Parallelograms, Rectangles, Rhombi, Squares, Kites, Trapezoids, Isosceles Trapezoids) and their properties.

Teacher preparation

The associated .tns file should be downloaded onto the student handhelds. If you choose to have students to type their conjectures into the document, you should be prepared to have students download their completed documents to your computer. You may also choose to have your students write their conjectures and support on paper; you should still check their documents for their support.

Classroom management tips

Roam about the room. Some students will need help with measuring angles and sides. Other students may need help "uncluttering" their screens.

TI-Nspire Applications

Graphs and Geometry.

Step-by-step directions

Students should work through the pages.

Assessment and evaluation

- *You must check the student's documents on their handhelds. If you are not downloading their work onto your computer and having students write their conjectures and support on paper, some students may not make any measurements or any drag tests.*
- *For some students at earlier Van Hiele levels with respect to quadrilaterals, it may be appropriate for them to base their support for their conjecture on how the quadrilateral looks.*
- *Many of the shapes can be dragged into different shapes. THIS IS THE IDEA BEHIND MYSTERY QUADRILATERALS! The students should choose the most general shape name for each one!*
- *The most difficult shape to identify is the cyclic quadrilateral on page 8. I use this shape to include something that the students have not seen. The cyclic quadrilateral can be dragged into a kite, a rectangle, a square, or an isosceles trapezoid.*
- *There is an associated .tns file with solutions.*

Activity extensions

- *This could be completed as a whole class activity. You could have your students work through each one, and then have some students present their "proofs" to the class.*
- *Students could list all the possible shapes for each mystery quadrilateral.*
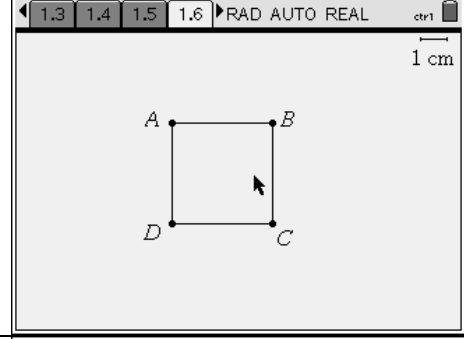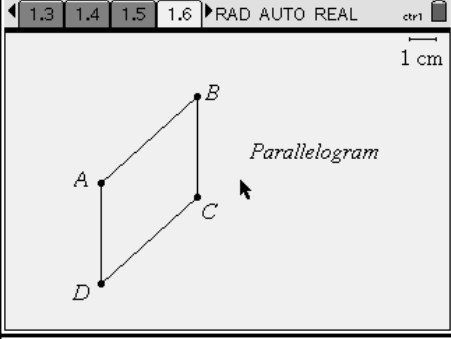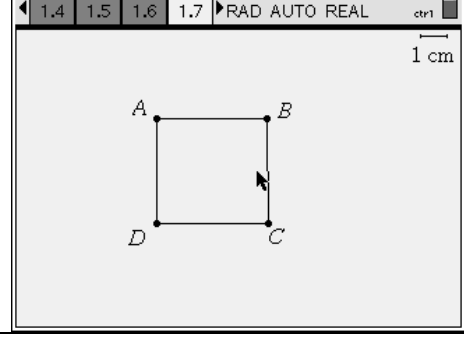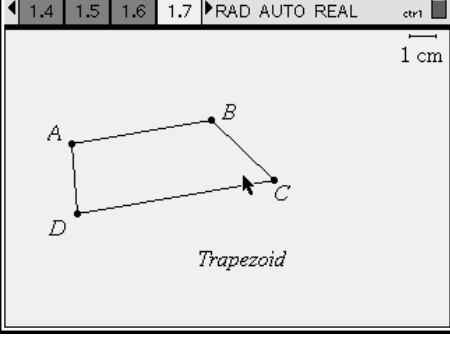
Mystery Quadrilateral!
by: Steve Phelps
Grade level: secondary
Subject: mathematics
Time required: 45 to 90 minutes

Materials: nSpire

- *Students could "group" the pages of the documents according the shapes that can be made (Which pages have a quadrilateral that can be dragged into a trapezoid?)*

Student TI-Nspire Document

Mystery Quadrilateral.tns.
SOLUTIONSMystery Quadrilateral.tns

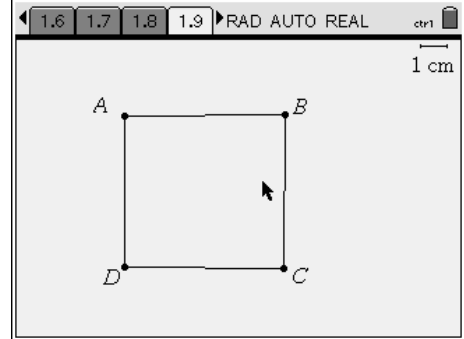| Mystery Quadrilaterl Screenshots	Solutions Screenshots with Correct Answer	Comments and Other Possible Shapes
		Square Rhombus Dart
		Square

Mystery Quadrilateral!
by: Steve Phelps
Grade level: secondary
Subject: mathematics
Time required: 45 to 90 minutes
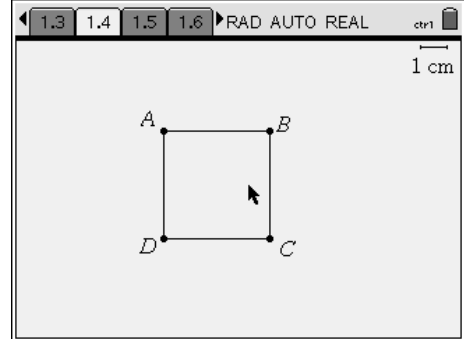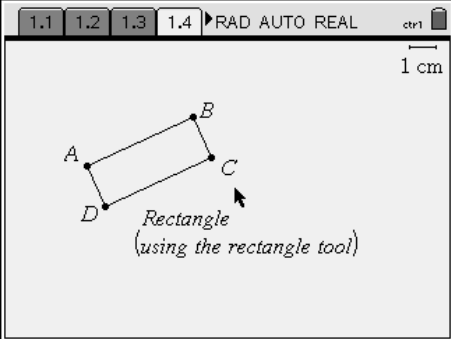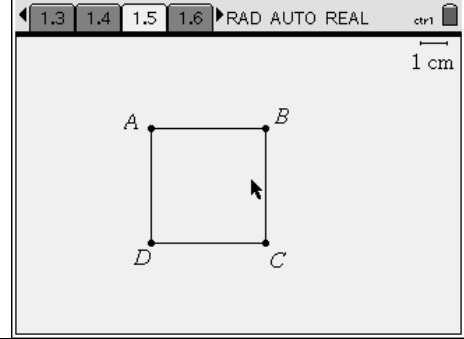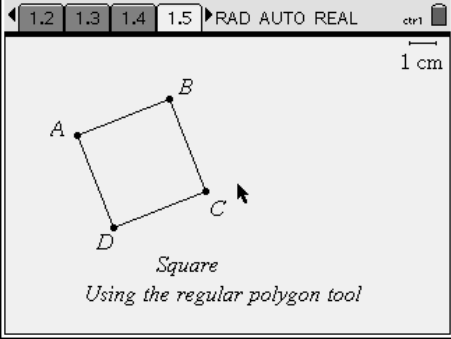
Materials: nSpire

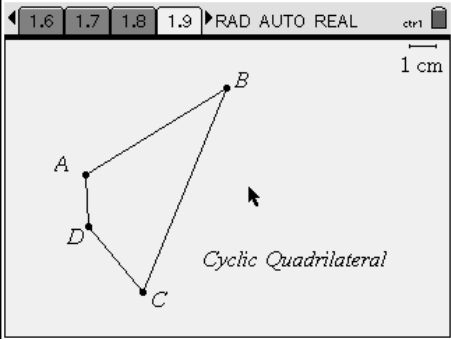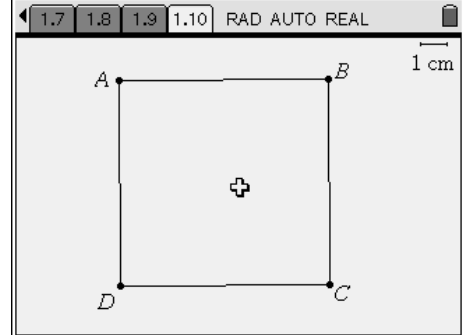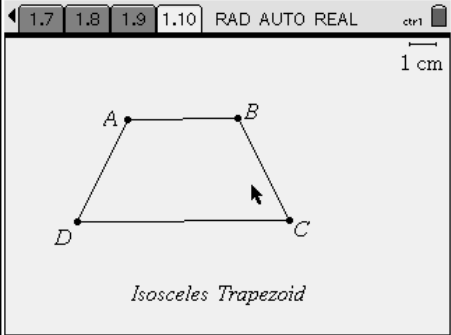|		
	Rectangle (using the rectangle tool)	Square
	Square Using the regular polygon tool	
	Parallelogram	Rectangle Rhombus Square
	Trapezoid	Isosceles Trapezoid Square Rectangle
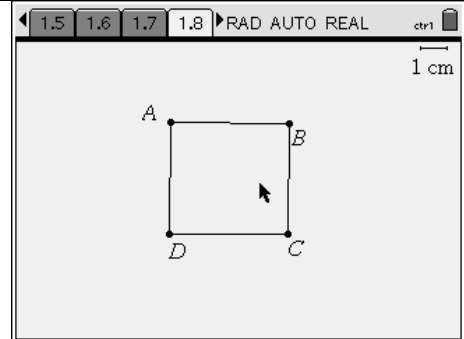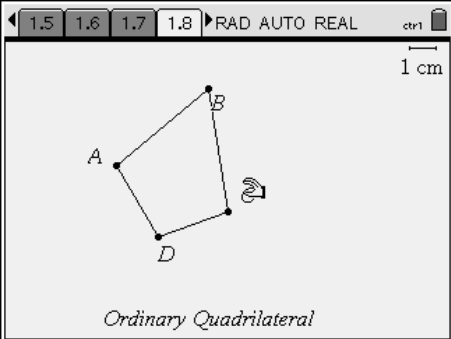
TEXAS INSTRUMENTS

Mystery Quadrilateral!
by: Steve Phelps
Grade level: secondary
Subject: mathematics
Time required: 45 to 90 minutes

Materials: nSpire

	 Ordinary Quadrilateral	Any of the quadrilaterals
	 Cyclic Quadrilateral	This is the most difficult on the student's first encounter. Isosceles Trapezoid Kite Rectangle Square
	 Isosceles Trapezoid	Rectangle Square