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GEO STIX: QUADRILATERALS

Volume 7

Developed by Kristin Ulrich

Grades 3-6

Topic

Using Geo Stix to determine angle measure of a variety of quadrilaterals.

Content

Use a protractor to measure the angles of and name a given quadrilateral.

Time

60 minutes.

Objectives

Students will be able to...

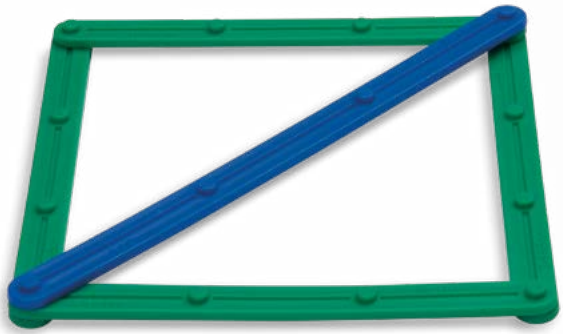
- Prove that the four angles in all quadrilaterals add up to 360 degrees.
- Examine a variety of quadrilaterals and measure each of their angle measures.
- Categorize quadrilaterals according to side lengths and angle measures.

Materials

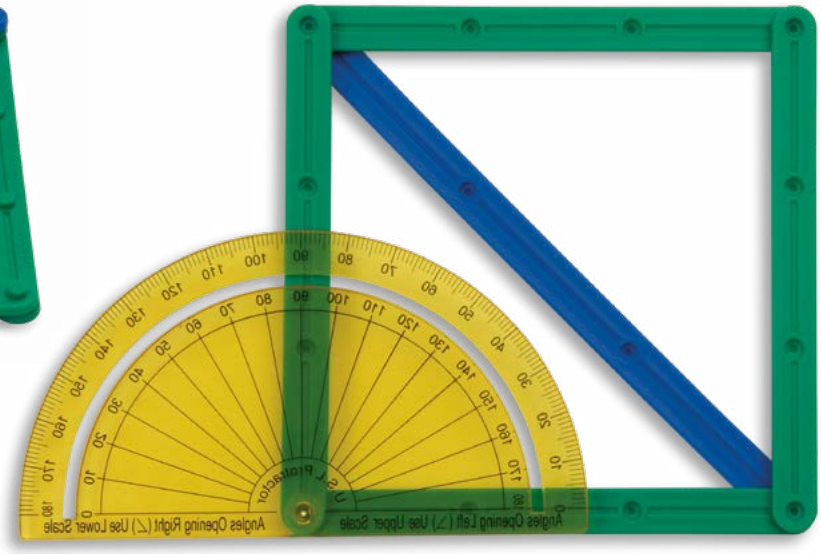
- Geo Stix Individual Set (Cat. No. TB25457) or Geo Stix Class Set (Cat. No. TB26482)
- Worksheets (attached with lesson plan download)

Learning Standards

- **CCSS.Math.Content.4.MD.C.6** — Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- **CCSS.Math.Content.5.G.B.3** — Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.



Make sure to connect to the front for easier measuring



Snap the protractor to the back to measure accurately

Introduction

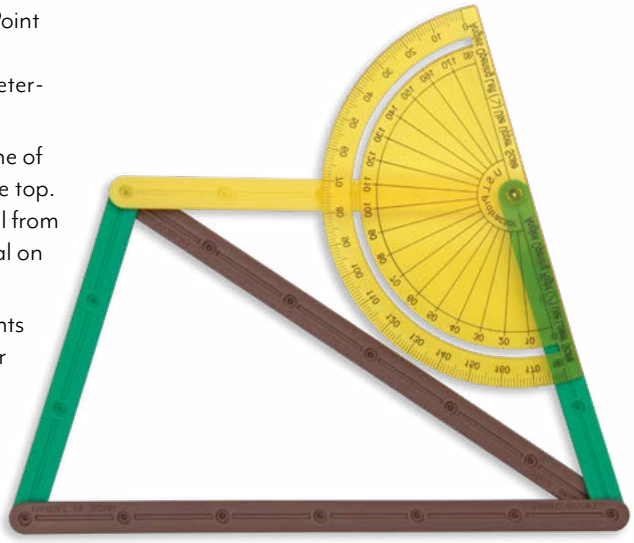
NOTE: It's very important that you teach students to always use the lines on the back of the Geo Stix when measuring. If they don't use the lines, they'll measure the angles incorrectly. Also, for each quadrilateral, one Geo Stix needs to be placed diagonally to connect two specific corners. Make sure students are connecting on the front of the shape. This makes it easier to measure the angles. Doing this will lock the figure and keep the angles the size they need to be when measuring.

1. Remind students that all quadrilaterals have four sides and that there are many types of quadrilaterals, including squares, rectangles, rhombuses, kites, trapezoids, and more. Students will get the opportunity to explore with all of these quadrilaterals. As they investigate quadrilaterals, they will be measuring the angles of each shape to help better classify the shapes.
2. Have students take four dark green legs and a blue leg. Use the four dark green legs to make the sides of the quadrilateral and the blue leg to connect the bottom right vertex to the upper left vertex. Be sure to model this for the students and that they connect the blue leg on the front of their quadrilateral.
3. Have students use their protractors to measure the bottom left angle of their quadrilateral. They should do this by putting the bottom left vertex of the square on the hole on the bottom of the protractor. Make sure the line on the back of the bottom dark green leg goes right along the straight line at the bottom of the protractor. Model how to do this while explaining what they should be doing. Since the angle opens to the right, students should use the inner set of numbers on the protractor. Everyone should come up with 90 degrees.
4. Follow the same procedure to obtain the measures of the bottom right angle and the top left angle of the quadrilateral. Be sure to model every step. Make sure students use the outer scale of numbers on their protractor for any angle that opens to the left and the inner scale for any angle that opens to the right. Students should conclude that both angles measure 90 degrees.
5. See if students can predict the measurement of the last angle, then have them measure it, making sure that they are using the outer scale on their protractor to do so. A good way to check for understanding is to have the students give you a thumbs up if their measurement matched their prediction of 90 degrees and a thumbs down if they didn't get 90 degrees.
6. Now it's time to figure out how many degrees are in this quadrilateral altogether. Have students add up all four measurements. *(90 + 90 + 90 + 90 = 360)* They now know that this quadrilateral has 360 degrees. Ask what this quadrilateral is more commonly known as. *(square)*
7. If needed, the exercise can be repeated by making a square made from four yellow legs connected with a red leg at the diagonal from bottom left to top right. If more practice is still needed, make another square by connecting four purple legs with a yellow leg at the diagonal from bottom left to top right.
8. In each instance, students should be able to determine that the angles all measure 90 degrees and the total degrees in each square is 360 degrees. The conclusion should be that the four angles in all squares are 90 degrees, and that the angles will always add up to 360 degrees.
9. Ask students why they think all the angles were always exactly the same. *(The legs for each square were all exactly the same.)*

Activity

1. Get students to wonder what would happen if they made a quadrilateral where the legs are two different lengths, then have students make a quadrilateral that has two red legs, two orange legs, and one brown leg. The red legs will be the top and bottom of the quadrilateral, the orange legs will be the sides, and the brown leg will be the diagonal that connects the bottom left vertex with the upper right vertex. Remind students that the brown diagonal should go across the front of the quadrilateral. Show your model of the quadrilateral to help guide students.
2. Measure the bottom left vertex of this quadrilateral by snapping the protractor to the back of the vertex. Make sure the line on the back of the red leg is lined up with the line on the bottom of the protractor. Be sure to model how to do this for students. Tell students to use the inside set of numbers on the protractor to obtain their measurement because the angle opens to the right. Remind students that they will get the exact angle measurement from the line that runs up the back of the orange leg. Students should get 90 degrees.
3. Students should measure the bottom right vertex the same way they did the bottom left vertex, except that this time they will use the outer scale of the protractor because the angle opens to the left. Have students give you a thumbs up if they get 90 degrees again and a thumbs down if they got a different measurement.
4. After they get 90 degrees for an answer again, students may begin to wonder if all angles in all quadrilaterals will always measure 90 degrees. To test that hypothesis, have students measure the last two angles of the quadrilateral. Students should be able to confirm that the last two angles measure 90 degrees. Once they know this, they should also be able to conclude that there are 360 degrees total in this shape. Ask students what kind of quadrilateral this is. *(rectangle)* Clarify that it is a rectangle because it has two pairs of parallel lines and four angles that all measure 90 degrees.
5. At this point, students may believe that this confirms their hypothesis that all angles in all quadrilaterals will always measure 90 degrees. Don't let them jump to conclusions! Point out that what they know so far is that the angles in squares and rectangles are all 90 degrees, and that the four angles always add up to 360 degrees. They still need to determine if that's true for other kinds of quadrilaterals.
6. Make a quadrilateral using two dark green legs, two brown legs, and a yellow leg. One of the brown legs will be the bottom leg of the quadrilateral and the yellow leg will be the top. The two dark green legs will be the sides, and the second brown leg will be a diagonal from the bottom left vertex to the top right vertex. Remind students to connect the diagonal on the front of their shape. Hold your model up for students to see.
7. Measure the bottom left vertex first by snapping the protractor behind it. Remind students that since the angle opens to the right, they need to use the inside scale of the protractor to obtain their measurement. They should come up with 106 degrees, showing that not all quadrilaterals have 90-degree angles.
8. Snap the protractor to the back of the bottom right vertex and measure it using the outside scale on the protractor. This angle should measure 74 degrees.
9. To measure the top left angle, have students flip their quadrilateral upside down. Since the angle will open to the left, they should use the inner scale on their protractor to measure it. They should come up with 106 degrees, the same as the bottom left angle.
10. This is a great time to get students wondering if all angles of all quadrilaterals, even if they are not all 90 degrees, add up to 360 degrees anyway. Have students add together the measurements of the three angles of this quadrilateral *(106 + 106 + 74 = 286)*, then have them subtract the 286 from 360. They should get 74.
11. Have the students measure the last angle to see if they get 74 degrees, which they should. Students should be able to observe that two of the angles measure 106 degrees and the other two angles measure 74 degrees. Ask students if they can name this quadrilateral that has one pair of parallel lines. Note that the trapezoid, like the square and the rectangle, has angles that add up to 360 degrees.

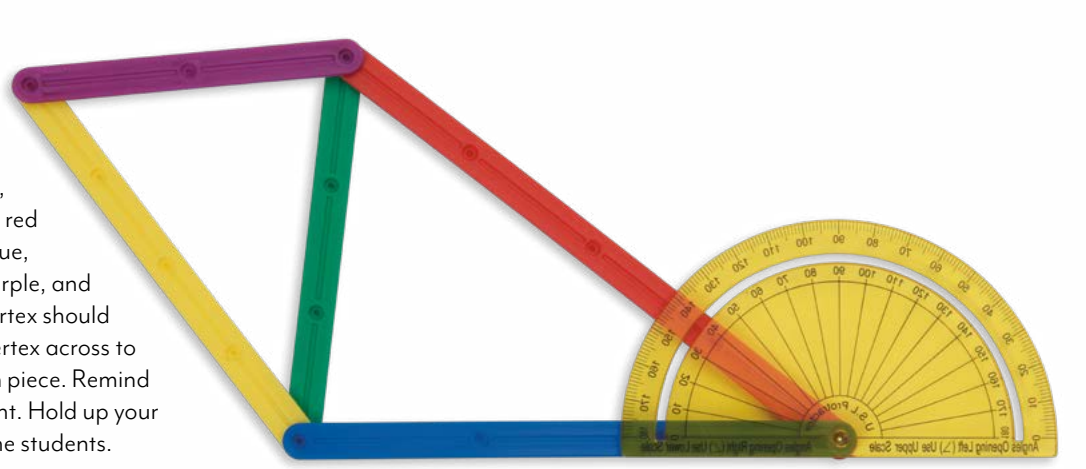
Activity Steps 1-4



Activity Steps 6-11

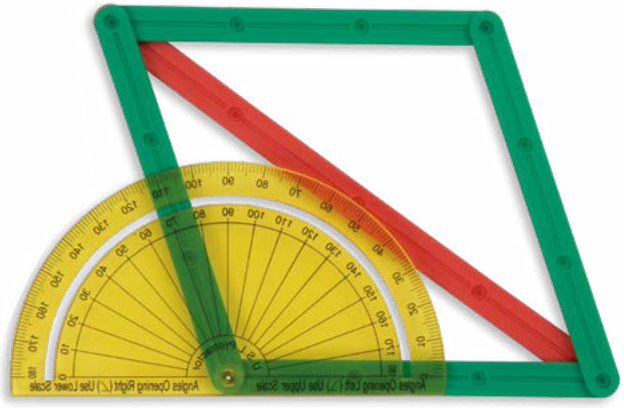
Activity (cont.)

12. Continue to test the hypothesis that all quadrilaterals have angles that add up to 360 degrees by creating a quadrilateral with one yellow leg, one purple leg, one dark green leg, one blue leg, and one red leg. They should connect the red to the blue, the blue to the yellow, the yellow to the purple, and the purple to the red. The red and blue vertex should be the bottom. Connect the red/purple vertex across to the blue/yellow vertex with the dark green piece. Remind students that it should connect on the front. Hold up your completed quadrilateral as a model for the students.



Activity Steps 12-17

13. Begin by measuring the bottom vertex where the red and blue leg meet. Remember to snap the protractor to the back, line up the bottom line of the protractor with the line on the back of the blue leg, and use the inner scale of numbers to measure the angle. Students should get 37 degrees.
14. Next, measure the red and purple vertex. Snap the protractor to the back, line up the bottom of the protractor with the line on the back of the red leg, and use the outer scale of numbers to measure the angle. Students should get 137 degrees.
15. Now move on to the purple and yellow vertex. Snap the protractor to the back, line up the bottom of the protractor with the line on the back of the purple leg, and use the inner scale of numbers to measure the angle. Students should get 62 degrees.
16. Although no angles measure 90 degrees, and no two angles have the same measure so far, students can still try to predict the measure of the last angle using what they already know. Working on the hypothesis that all quadrilaterals have angles that add up to 360 degrees, students should add the three angles they've already measured together, then subtract that number from 360 to predict the measure of the last angle. *(37 + 137 + 62 = 236; 360 – 236 = 124)*
17. Students should now measure the last angle, where the blue and yellow leg meet. Snap the protractor to the back, line up the bottom line of the protractor with the line on the back of the yellow leg, and use the inner scale of numbers to measure the angle. Students should match their prediction of 124 degrees.
18. The last quadrilateral students will create uses four dark green legs and one red leg. Snap the four dark green legs together and use the red leg as a diagonal between the bottom left vertex and the top right vertex.
19. Measure the bottom left vertex of the quadrilateral by snapping the protractor to the back, lining up the bottom line of the protractor with the line on the back of the bottom dark green leg, and using the outside scale of numbers. Students may be surprised to get 71 degrees, since many probably predicted that they would be making another square.
20. Measure the bottom right vertex the same as before, but being sure to use the inside scale on the protractor this time. Students should get 109 degrees.
21. Measure the top left vertex by snapping the protractor in upside down, lining up the bottom line of the protractor with the line along the back of the top dark green leg, and using the inside scale of numbers. Students should get 109 degrees.
22. Students should now be able to predict the measure of the last angle. *(71 + 109 + 109 = 289; 360 – 289 = 71)* They can now double-check their work by measuring the final angle. Flip the protractor upside down, line up the bottom line of the protractor with the line that runs across the back of the top dark green leg, and use the inside scale of numbers. They should get 71 degrees.



Activity Steps 18-23

23. Point out that their hypothesis was correct: all quadrilaterals do have angles that measure up to 360 degrees. Also ask them what a shape like this, with four sides of equal length, two sets of parallel lines, but angles that aren't necessarily 90 degrees, is called. *(rhombus)*.

Checking for Understanding

After students have completed the first two problems, check for understanding by using the following line of questioning. Project an example of the worksheet on the board that you can fill in as students answer the following questions:

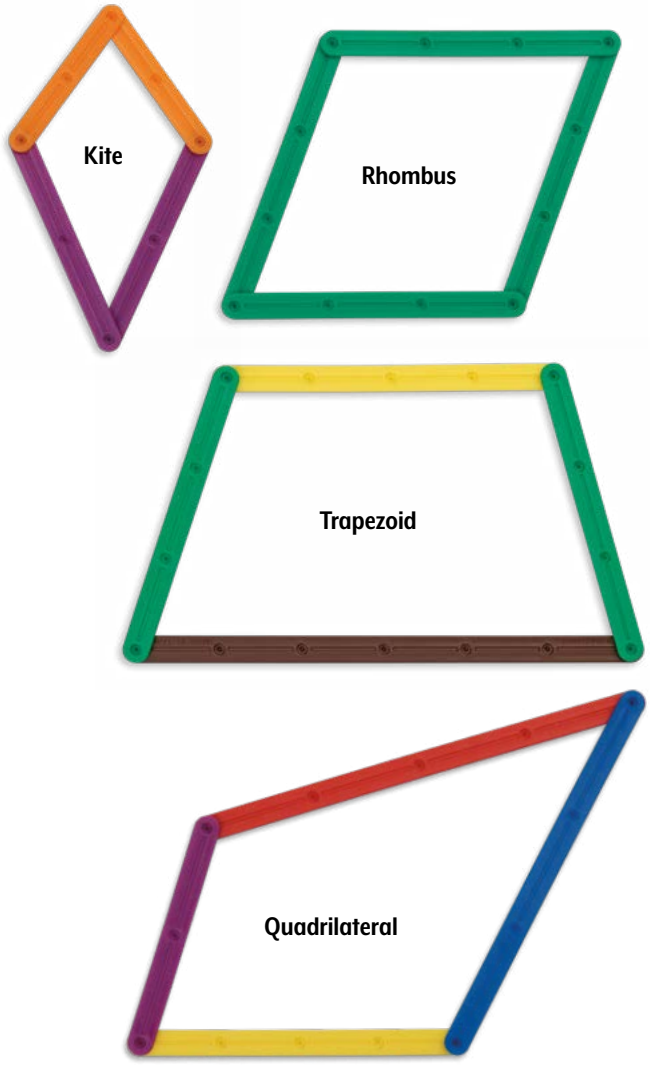
Problem 1

1. What is the measure of the bottom left vertex? *(60 degrees)*
2. What is the measure of the bottom right vertex? *(120 degrees)*
3. What is the measure of the top left vertex? *(80 degrees)*
4. What would we expect the final angle to measure? *(60 degrees)*
5. How do we fill in the four-part equation? *(60 degrees + 120 degrees + 120 degrees + 60 degrees = 360 degrees)*
6. What type of quadrilateral was that? *(Rhombus)*
7. How do we know? *(All four legs were the same length with two sets of parallel lines.)*
8. If all the legs are the same length, why couldn't we call it a square? *(No 90-degree angles.)*

Problem 2

9. What is the measure of the bottom left vertex? *(100 degrees)*
10. What is the measure of the bottom right vertex? *(80 degrees)*
11. What is the measure of the top left vertex? *(80 degrees)*
12. What would we expect the final angle to measure? *(100 degrees)*
13. How do we fill in the four-part equation? *(100 degrees + 80 degrees + 80 degrees + 100 degrees = 360 degrees)*
14. What type of quadrilateral was that? *(Parallelogram)*
15. How do we know? *(It has two pairs of parallel lines.)*
16. If it has two pairs of parallel lines, can we also call it a triangle? *(No, because it doesn't have 90-degree angles.)*
17. Can we call it a rhombus? *(No, because all the legs aren't the same length.)*

Students should complete problems 3-5 independently.



Intervention

1. Only work on problems that include squares, rectangles, rhombuses, and parallelograms.
2. All problems could be done in a whole-group setting.
3. Strategically match students who understand the concept with struggling students and let them teach one another.
4. Add which scale of the protractor (inside or outside) is used for each angle students will measure.
5. An Intervention Worksheet has also been provided.

Extension

1. Have students work with a partner and create their own quadrilaterals using different legs.
2. Students can begin to explore with pentagons, hexagons, and octagons.
3. An Extension Worksheet has also been provided.

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Geo Stix Quadrilaterals Worksheet

Directions: Create the quadrilaterals described in each problem. Assemble each quadrilateral exactly as you are instructed to in the problem. Measure the first three angles, predict the measure of the fourth angle, measure it, and then finally name the quadrilateral from the choices listed below.

Square — Four sides of equal length, two pairs of parallel lines, four angles that measure 90 degrees, angles add up to 360 degrees
Rectangle — Two pairs of parallel lines, four angles that measure 90 degrees, angles add up to 360 degrees
Parallelogram —Two pairs of parallel lines, angles add up to 360 degrees
Rhombus — Four sides of equal length, two pairs of parallel lines, angles add up to 360 degrees
Trapezoid — One pair of parallel lines, angles add up to 360 degrees
Irregular — No parallel lines, angles add up to 360 degrees

1. Use four purple legs and one blue leg. Create the quadrilateral out of the four purple legs. The blue leg should diagonally connect the bottom left vertex with the top right vertex.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

2. Use two green legs for the top and bottom of a quadrilateral. Use two purple legs for the sides of the quadrilateral. Use a yellow leg to connect the bottom left vertex with the top right vertex.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

Name: _____

Geo Stix Quadrilaterals Worksheet (continued)

3. Use a red leg for the bottom of the quadrilateral and a dark green leg for the top. Connect the top to the bottom of each side with a yellow leg. Use a red leg to connect the bottom left vertex with the top right vertex of the quadrilateral.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

4. Use one red leg and connect that to an orange leg. Connect the other side of the orange leg to a brown leg. Connect the brown leg to a purple leg. Connect the purple leg to the red leg you started with. Use a blue leg to diagonally connect the purple leg to the orange leg. The brown leg should be the bottom of your quadrilateral.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

Name: _____

Geo Stix Quadrilaterals Worksheet (continued)

5. Use four dark green legs to create the quadrilateral. Use a red leg to diagonally connect the bottom left vertex to the top right vertex.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

Name: _____

Geo Stix Quadrilaterals
Intervention Worksheet

Square — Four sides of equal length, two pairs of parallel lines, four angles that measure 90 degrees, angles add up to 360 degrees
Rectangle — Two pairs of parallel lines, four angles that measure 90 degrees, angles add up to 360 degrees
Parallelogram —Two pairs of parallel lines, angles add up to 360 degrees
Rhombus — Four sides of equal length, two pairs of parallel lines, angles add up to 360 degrees

- **For Angle 1, always use the inside scale because the angle opens to the right.**
- **For Angle 2, always use the outside scale because the angle opens to the left.**
- **For Angle 3, always use the inside scale because the angle opens to the right.**
- **For Angle 4, always use the outside scale because the angle opens to the left.**

1. Create a quadrilateral using four yellow legs. Once you've made it, connect the bottom left vertex to the top right vertex with a diagonal red leg.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

2. Create a quadrilateral that uses two purple legs and two blue legs. The purple legs will be the side legs and the blue legs will be the top and bottom. Connect the bottom left vertex with the upper right vertex using a diagonal red leg.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

Name: _____

Geo Stix Quadrilaterals
Intervention Worksheet (continued)

3. Create a quadrilateral that uses two purple legs and two blue legs. The purple legs will be the side legs and the blue legs will be the top and the bottom. Connect the bottom left vertex with the upper right vertex using a diagonal brown leg.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

4. Create a quadrilateral that has four orange legs. Connect the bottom left vertex with the upper right vertex using a diagonal dark green leg.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

Name: _____

Geo Stix Quadrilaterals
Intervention Worksheet (continued)

5. Create a quadrilateral that uses two yellow legs for the top and bottom. Use two purple legs for the sides of the quadrilateral. Connect the bottom left vertex to the top right vertex using a diagonal red leg.

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

What type of quadrilateral did you create? _____

Name: _____

Geo Stix Quadrilaterals
Extension Worksheet

1. Create your own square.

What color did you choose for the legs? _____

What color did you choose for the diagonal? _____

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

2. Create your own rectangle.

What two colors did you choose for the legs? _____

What color did you choose for the diagonal? _____

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

Name: _____

Geo Stix Quadrilaterals
Extension Worksheet (continued)

3. Create your own trapezoid.

What three colors did you choose? _____

What color did you choose for the diagonal? _____

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

4. Create your own rhombus.

What color did you choose for the legs? _____

What color did you choose for the diagonal? _____

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

Name: _____

Geo Stix Quadrilaterals
Extension Worksheet (continued)

5. Create your own irregular quadrilateral.

What four colors did you choose? _____

Did you add a diagonal? YES NO If yes, what color did you use? _____

What is the measure of the angle at the bottom left vertex? _____ (Angle 1)

What is the measure of the angle at the bottom right vertex? _____ (Angle 2)

What is the measure of the angle at the top left vertex? _____ (Angle 3)

Use the formula to figure out the measure of the fourth angle at the top right vertex.

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ = _____ degrees

360 – (total of last problem) _____ = _____ degrees

What is the measure of the angle at the top right vertex? _____ (Angle 4)

(Angle 1) _____ + (Angle 2) _____ + (Angle 3) _____ + (Angle 4) _____ = _____ degrees

Answer Keys for Geo Stix Quadrilaterals Worksheets

Geo Stix Quadrilaterals Worksheet

1. Bottom left angle: 60 degrees Bottom right angle: 120 degrees
   Top left angle: 120 degrees Top right angle: 60 degrees
   Rhombus

2. Bottom left angle: 100 degrees Bottom right angle: 80 degrees
   Top left angle: 80 degrees Top right angle: 100 degrees
   Parallelogram

3. Bottom left angle: 78 degrees Bottom right angle: 69 degrees
   Top left angle: 99 degrees Top right angle: 114 degrees
   Trapezoid

4. Bottom left angle: 107 degrees Bottom right angle: 49 degrees
   Top left angle: 60 degrees Top right angle: 144 degrees
   Irregular quadrilateral

5. Bottom left angle: 70 degrees Bottom right angle: 110 degrees
   Top left angle: 110 degrees Top right angle: 70 degrees
   Rhombus

Geo Stix Quadrilaterals Intervention Worksheet

1. All angles should measure 90 degrees.
   Square

2. All angles should measure 90 degrees.
   Rectangle

3. Bottom left angle: 80 degrees Bottom right angle: 100 degrees
   Top left angle: 100 degrees Top right angle: 80 degrees
   Parallelogram

4. Bottom left angle: 60 degrees Bottom right angle: 120 degrees
   Top left angle: 120 degrees Top right angle: 60 degrees
   Rhombus

5. Bottom left angle: 70 degrees Bottom right angle: 110 degrees
   Top left angle: 110 degrees Top right angle: 70 degrees
   Parallelogram