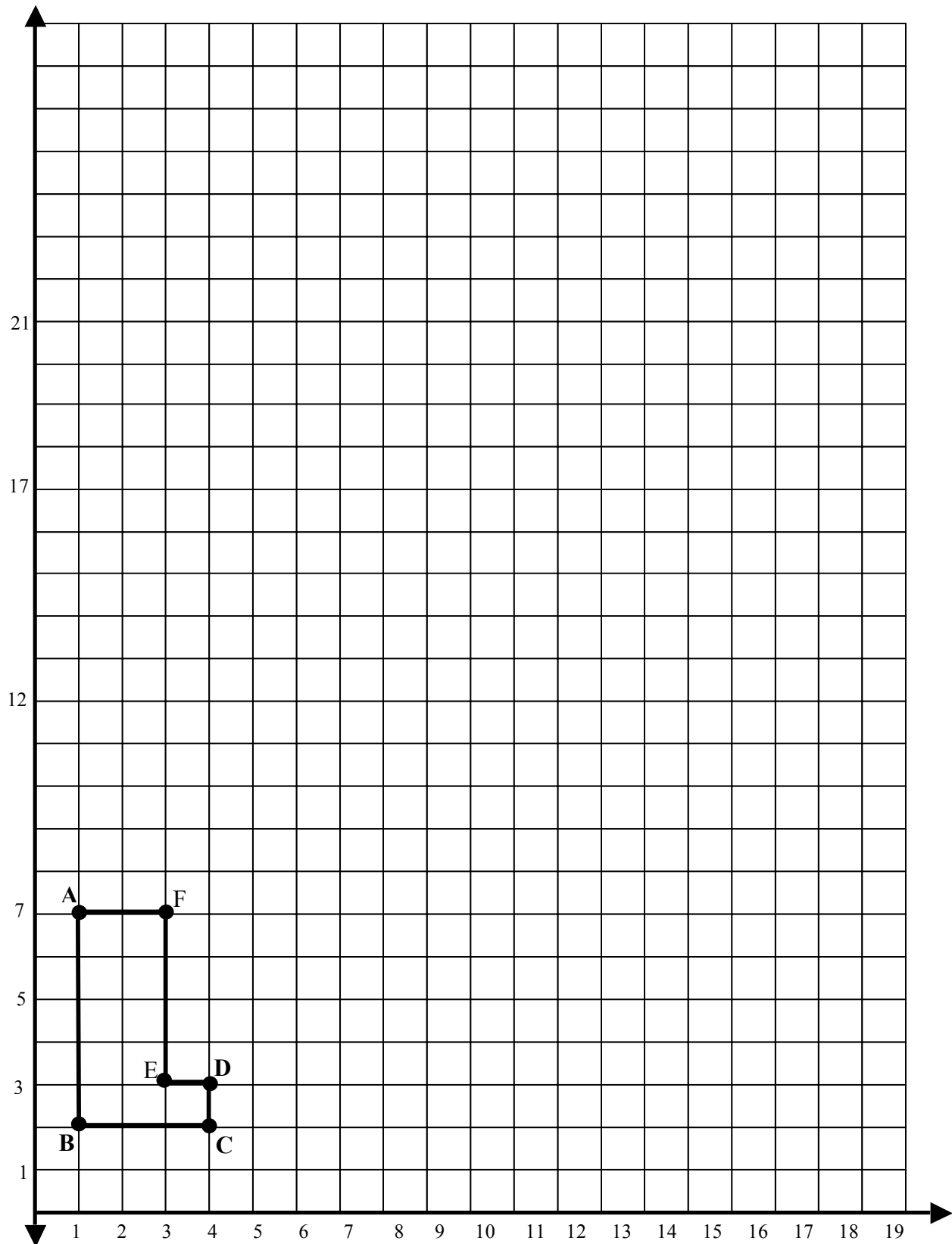


TASK 1.3.5: CHANGING AREA — STUDENT ACTIVITY

Solutions**Task 1.3.5: Changing Area–Student Activity****Changing x and y Coordinates**

	Area
Original lengths	11
When the x - and y -coordinates are multiplied by 2	44
When the x - and y -coordinates are multiplied by 3	99
When the x - and y -coordinates are multiplied by 4	176
When the x - and y -coordinates are multiplied by 5	275

- Record the area of polygon ABCDEF in the table.
- Multiply each x and y -coordinate of the polygon ABCDEF (Figure 1) by 2. Using a colored pencil, draw the new Figure 2. Determine the area of Figure 2 and enter it in the table.
- Multiply each original x and y -coordinate of Figure 1 by 3. Using a different colored pencil, draw the new Figure 3. Determine the area of Figure 3 and enter it in the table.
- Multiply each original x and y -coordinate of Figure 1 by 4. Using a different colored pencil, draw the new Figure 4. Determine the area of Figure 4 and enter it in the table.
- Multiply each original x and y -coordinate of Figure 1 by 5. Without drawing the new figure, determine its area. Enter the area in the table.
- Look at your drawings or the table from Task 3 and explain what happens to the lengths of a figure when both the x and y coordinates are doubled, tripled, etc. **Each of the lengths grow by the multiplier; if the multiplier is 3, then the length becomes 3 times as long and the width becomes 3 times longer.**
- Look at your drawings or the table from Task 3 and explain what happens to the perimeters of a figure when both the x and y coordinates are doubled, tripled, etc.

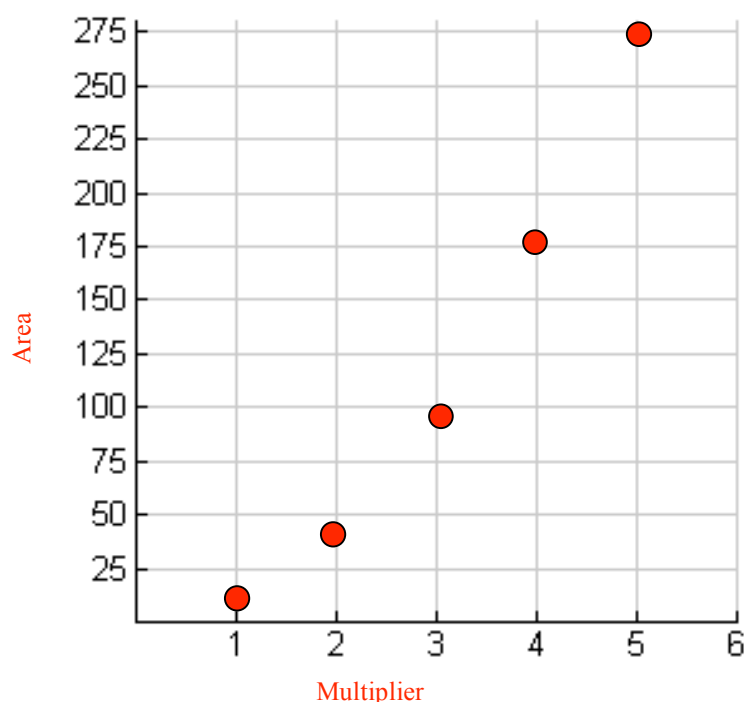
Algebra I: Strand 1. Foundations of Functions; Topic 3. Changing Perimeter; Task 1.3.5

Since both the lengths and widths are changed by the multiplier, the perimeter is also changed by the same amount. If the length and width are multiplied by 3 and become 3 times larger, the perimeter will become 3 times greater.

8. Use your new drawings and show what happens to the area of a figure when both the x and y coordinates are doubled, tripled, etc.

The area of a figure is increased by the square of the multiplier. The length and the width of the figure change. If the coordinates are multiplied by 3, then the length is 3 times longer and the width is three times longer and the area grew by 3×3 .

9. Graph the area vs. multiplier on the grid below. Label the axes.



10. Explain how the area is affected when the dimensions of a figure are changed proportionally.

The area is multiplied by the square of the scale factor.

Algebra I: Strand 1. Foundations of Functions; Topic 3. Changing Perimeter; Task 1.3.5

Teaching notes

Dilations are included in the 8th grade TEKS, however students may not have significant exposure and hands-on experiences to understand the concept. As an introduction to this activity, the teacher may need to review dilations.

Technology notes

Refer to the activity “Stacking Hexagons” for detailed technology notes on using the graphing calculator to find the $\Delta L1/\Delta L2$ as well as $L1/L2$.

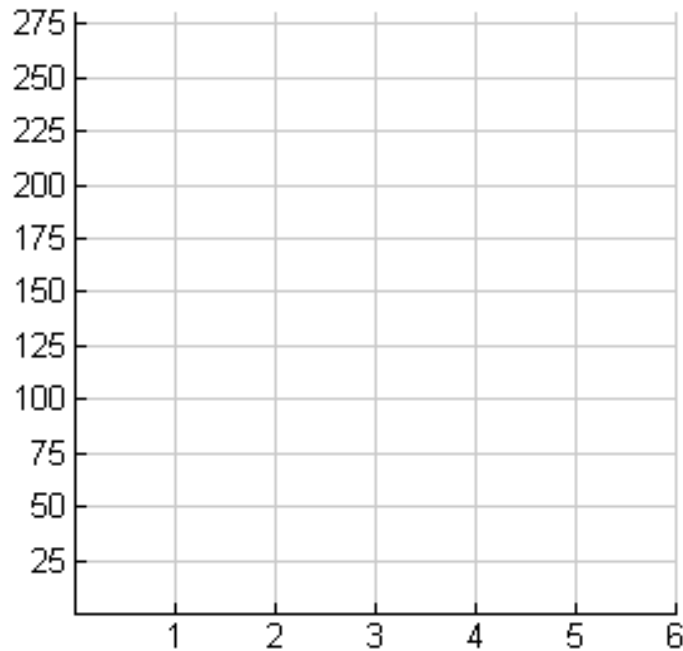
TASK 1.3.5: CHANGING AREA — STUDENT ACTIVITY**Changing x and y Coordinates**

	Area
Original Lengths	
x and y-multiplied by 2	
x and y-multiplied by 3	
x and y-multiplied by 4	
Predict x and y-multiplied by 5	

1. Record the area of polygon ABCDEF in the table.
2. Multiply each x and y -coordinate of polygon ABCDEF (Figure 1) by 2. Using a colored pencil, draw the new Figure 2. Determine the area of Figure 2 and enter it in the table.
3. Multiply each original x and y -coordinate of Figure 1 by 3. Using a different colored pencil, draw the new Figure 3. Determine the area of Figure 3 and enter it in the table.
4. Multiply each original x and y -coordinate of Figure 1 by 4. Using a different colored pencil, draw the new Figure 4. Determine the area of Figure 4 and enter it in the table.
5. Multiply each original x and y -coordinate of Figure 1 by 5. Without drawing the new figure, determine its area. Enter the area in the table.
6. Look at your drawings or the table from Task 3 and explain what happens to the lengths of a figure when both the x and y coordinates are doubled, tripled, etc.

Algebra I: Strand 1. Foundations of Functions; Topic 3. Changing Perimeter; Task 1.3.5

7. Look at your drawings or the table from Task 3 and explain what happens to the perimeters of a figure when both the x and y coordinates are doubled, tripled, etc.
8. Use your new drawings and show what happens to the area of a figure when both the x and y coordinates are doubled, tripled, etc.
9. Graph the area vs. multiplier on the grid below. Label the axes.



10. Explain how the area is affected when the dimensions of a figure are changed proportionally