Translations: Lesson 3 Grid & Coordinates Name _____

Student Activity Class _____

In this lesson, you will investigate the coordinates of vertices of translated triangles and look for patterns.

Open the document: *Translations.tns.*

It is important that one of the Translations Tours be done before any Translations lessons.

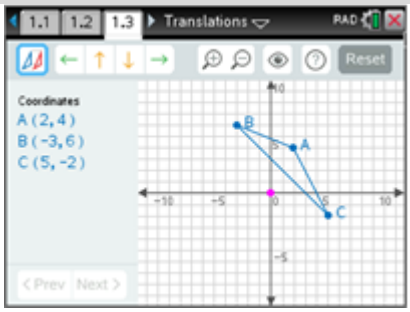
PLAY INVESTIGATE EXPLORE DISCOVER

Move to page 1.3. (ctrl ▶ two times)

On the handheld, press ctrl ▶ and ctrl ◀ to navigate through the pages of the lesson.
(On the iPad®, select the page thumbnail in the page sorter panel.)

1. Press menu to open the menu.

   (On the iPad, tap the wrench icon to open the menu.)
   Press 1 (1: Templates), 5 (5: Grid & Coordinates).



2. Translate ΔABC **to the right 5 units** by pressing the right arrow (▶) 5 times.

   Then click on or press T. Zoom in (+) or out (−) as needed.

   a. Record the Original coordinates (first coordinates displayed) in the first row of the table below. Look for patterns.

   b. Investigate and mentally make note of the coordinates by grabbing and moving each of the three vertices of ΔABC (A, B, C) to create different shaped triangles.
   Record a set of data observed in row "Figure 1" in the following table.
   Repeat and move each of the three vertices and record a set of data in row "Figure 2" below.
   Look for patterns among the coordinates of corresponding vertices.
   Which coordinates remain the same? Which coordinates change? How? Discuss.

Translate Right 5	A	B	C	A'	B'	C'
Original						
Figure 1						
Figure 2						

c. Using the pattern observed in the previous table, if a point on the pre-image triangle has coordinates (1, 2), what are the coordinates of the corresponding point on the image triangle?
That is (1, 2) → _____ '→' means "maps to"

Similarly, the point (– 3, 7) would be translated to? That is (– 3, 7) → _____.

d. Generalize the pattern. If a point on the pre-image triangle has coordinates (x, y), what are the coordinates of the corresponding point on the image triangle?

That is (x, y) → _____ '→' means "maps to"

3. Reset the page. Press Reset (ctrl del).
Translate ΔABC **down 4 units** by pressing the down arrow (▼) 4 times.
Then click on or press T). Zoom in (+) or out (–) as needed.

a. Record the Original coordinates (first coordinates displayed) in the first row of the following table. Look for patterns.

b. Investigate and mentally make note of the coordinates by grabbing and moving each of the three vertices of ΔABC (A, B, C) to create different shaped triangles.
Record a set of data observed in row "Figure 1" in the following table.
Repeat and move each of the three vertices and record a set of data in row "Figure 2" below.
Look for patterns among the coordinates of corresponding vertices.
Which coordinates remain the same? Which coordinates change? How? Discuss.

Translate Down 4	A	B	C	A'	B'	C'
Original						
Figure 1						
Figure 2						

c. Using the pattern observed in the previous table, if a point on the pre-image triangle has coordinates (1, 2), what are the coordinates of its corresponding point on the image triangle?
That is (1, 2) → _____ '→' means "maps to"

Similarly, the point (– 3, 7) would be translated to? That is (– 3, 7) → _____.

d. Generalize the pattern. If a point on the pre-image triangle has coordinates (x, y), what are the coordinates of its corresponding point on the image triangle?

That is (x, y) → _____ '→' means "maps to"

4. Reset the page. Press Reset (ctrl del).
Translate ΔABC **to the left 3 units and up 2 units**.
Then click on or press T). Zoom in (+) or out (−) as needed.

a. Record the Original coordinates (first coordinates displayed) in the first row of the following table. Look for patterns.

b. Investigate and mentally make note of the coordinates by grabbing and moving each of the three vertices of ΔABC (A, B, C) to create different shaped triangles.
Record a set of data observed in row "Figure 1" in the following table.
Repeat and move each of the three vertices and record a set of data in row "Figure 2" below.
Look for patterns among the coordinates of corresponding vertices.

Translate **Up 2 Left 3**	A	B	C	A'	B'	C'
Original						
Figure 1						
Figure 2						

c. Using the pattern observed in the previous table, if a point on the pre-image triangle has coordinates (1, 2), what are the coordinates of its corresponding point on the image triangle?
That is (1, 2) → _____ '→' means "maps to"

Similarly, the point (– 3, 7) would be translated to? That is (– 3, 7) → _____.

d. Generalize this: If a point on the pre-image triangle has coordinates (x, y), what are the coordinates of the corresponding point on the image triangle?

That is (x, y) → _____ '→' means "maps to"

5. Given: ΔDEF is translated to the right 4 units and down 2 units.

   a. If D has coordinates (5, 7), what are the coordinates for D'? _____

   b. If E has coordinate (– 3, – 7), what are the coordinates of E'? _____

   c. If F' has coordinates (1, 6), what are the coordinates of F? _____

   d. If D has coordinates (x, y), what are the coordinates for D'? _____

6. Given: ΔPQR is translated up 5 units and to the left 6 units.

   a. If P has coordinates (5, 7), what are the coordinates for P'? _____

   b. If Q has coordinate (– 3, – 7), what are the coordinates of Q'? _____

   c. If R' has coordinates (1, 6), what are the coordinates of R? _____

   d. If P has coordinates (x, y), what are the coordinates for P'? _____

7. Given: ΔXYZ is translated to the left 3 units and down 9 units.

   a. If X has coordinates (5, 7), what are the coordinates for X'? _____

   b. If Y has coordinate (– 3, – 7), what are the coordinates of Y'? _____

   c. If Z' has coordinates (1, 6), what are the coordinates of Z? _____

   d. If X has coordinates (x, y), what are the coordinates for X'? _____