

# Translations Tour: Lesson 0

## Student Activity

Name \_\_\_\_\_

Class \_\_\_\_\_

In this activity, you will investigate the defining properties of the transformation known as a translation by moving a triangle up, down, left, and right a number of units.

You will also learn how to easily and quickly maneuver within all the Translations activities using shortcut keys or the tab key.

Open the document: *Translations.tns*.

PLAY INVESTIGATE EXPLORE DISCOVER

Move to page 1.2. ( **ctrl** ▶ )

On the handheld, press **ctrl** ▶ and **ctrl** ◀ to navigate through the pages of the lesson.

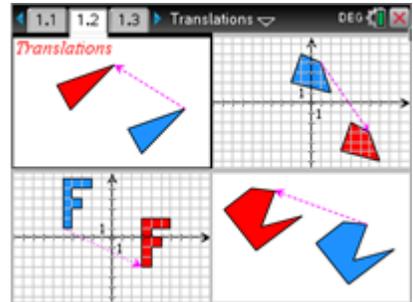
(On the iPad®, select the page thumbnail in the page sorter panel.)



1. What do the 4 parts of the screen have in common?

Make two conjectures.

A **conjecture** is an opinion or conclusion based upon what is observed. Quickly discuss with your group.



Move to page 1.3. ( **ctrl** ▶ ) Look at the figure below of an overview of the main translations page and shortcut keys. ***Epecially notice what the shortcut keys T, +, and - represent.***



## Navigating to and Selecting Screen Options or Objects

### Handheld Tech Tip:

To choose an option or object, use any of the following 3 methods:

- Use the touchpad to move the pointer over the option or object and press the center of the touchpad () to select (**click**) it.
- Use  to move to the next option or object on the screen and use   to go to the previous option or object.
- Use a **shortcut key** (ex:  for vertex A,  to Translate, etc.). Letters , ,  are located at the bottom of the handheld.

Use the method that works best for you: **click**, **tab** or **shortcut key**.



### iPad Tech Tip:

To choose a command or object, tap the icon or the object.

2. On the handheld, press the tab key () multiple times and notice each of the icons and points as they are highlighted. To go in the opposite direction, press  . Investigate.
3. Shortcut keys provide a fast way to perform actions and/or select objects on the screen on the handheld. A list of all shortcuts can be found in the Shortcut Keys Help menu (click on  or press ). **Look at this list now.** Use as needed. Press  or  to close the Shortcut Keys Help menu.
4. To translate  $\triangle ABC$ , press the Translate key (click on  or press ). Press the up arrow () on the touchpad two times, then press the right arrow () three times. Zoom   in () or out () as needed. Observe what happens on the screen.  
  
Blue  $\triangle ABC$  is called the pre-image and red  $\triangle A'B'C'$  is called the image.  $\triangle A'B'C'$  is read "triangle A prime, B prime, C prime".
5. To move and grab a vertex, press the letter key that corresponds to the vertex such as A (), and use the directional arrows (, , , ) on the touchpad to move vertex A. Grab and move point A to play, explore and discover ideas and investigate patterns.



Note: You can also use the **tab** key or **click** on the vertex that is needed.  
(On the iPad®, tap the desired point and move it.)

What appears to be the relationship between  $\triangle ABC$  and  $\triangle A'B'C'$ ? Discuss in your groups.

Grab and move vertex B (**B**). Grab and move vertex C (**C**). Observe.

Discuss with your partner or group: what appears to be true about the pre-image and its image?  
Write your conjecture below. A **conjecture** is an opinion or conclusion based upon what is observed.

6. Reset the page. Press **Reset** ( **ctrl** **del** ).

Press the down arrow (**▼**) on the touchpad four times, then press the right arrow (**►**) five times.

Translate  $\triangle ABC$  (click on  or press (**T**)). Zoom   in (**+**) or out (**-**) as needed.

a. Discuss with your group as to what happens to every point on the pre-image  $\triangle ABC$  to obtain the image  $\triangle A'B'C'$ .

Proceed as follows for better visualization:

Open the Options menu (press  or (**O**)). Press the down arrow (**▼**) 5 times and press the space bar (**␣**) to put a check mark on 'Resultant Vector'. Press **enter** or **esc** to close the menu.

Notice the three rays on the screen: the green ray is the horizontal component vector, the orange ray is the vertical component vector, while the pink ray is called the **resultant** vector.

Grab point W (**W**) and move it to coincide with vertex A. What point coincides with V?

Grab point W (**W**) and move it to coincide with vertex B. What point coincides with V?

Grab point W (**W**) and move it to coincide with vertex C. What point coincides with V?

Discuss in your group.

b. Write a conjecture with respect to what happens to every point on the pre-image to obtain the image.

7. Reset the page. Press **Reset** ( **ctrl** **del** ).

Press the down arrow (**▼**) on the touchpad three times, then press the left arrow (**◀**) five times.



Translate  $\triangle ABC$  (click on  or press **T**).

Zoom   in **(+)** or out **(-)** as needed. Observe what happens on the screen. Proceed as follows for better visualization:

Open the Options menu (press  or **O**). Press the down arrow (**▼**) 5 times and press the space bar (**␣**) to put a check mark (select it) on 'Resultant Vector'. Then move to 'Connected Segments' and press the space bar (**␣**) to select it. Press **enter** or **esc** to close the menu.

Look at the dashed segments,  $\overline{AA'}$ ,  $\overline{BB'}$ , and  $\overline{CC'}$ .

Grab point W (**W**) and move it to coincide with vertex A. What point coincides with V?

Grab point W (**W**) and move it to coincide with vertex B. What point coincides with V?

Grab point W (**W**) and move it to coincide with vertex C. What point coincides with V?

Grab point V (**V**) and move it around the screen. Discuss what you observe with your group.

Look at the dashed segments,  $\overline{AA'}$ ,  $\overline{BB'}$ , and  $\overline{CC'}$ . Discuss with your group what you notice about those 3 segments and write your conjecture(s) below.

8. Many different triangles have been translated in several different directions. Based upon your observations, write several conjectures about what seems to be true about a triangle and its translation.  
A **conjecture** is an opinion or conclusion based upon what is observed.

9. In a translation  $\triangle ABC$  is typically called the \_\_\_\_\_ triangle and

$\triangle A'B'C'$  is typically called the \_\_\_\_\_ triangle.

How is  $\triangle A'B'C'$  read? \_\_\_\_\_

10. What is another word or words that you could use to describe what a translation does?

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