Reflections Lesson 0: Tour

Student Activity

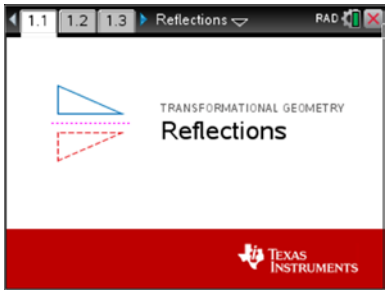
Name _____

Class _____

In this activity, you will investigate the defining properties of the transformation known as a reflection. You will also learn how to easily and quickly maneuver within all the Reflections activities – using shortcut keys or the tab key.

Open the document: *Reflections.tns.*

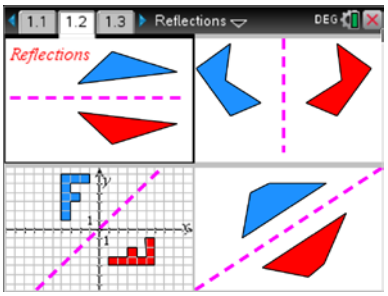
PLAY INVESTIGATE EXPLORE DISCOVER



Move to page 1.2. (ctrl ▶)

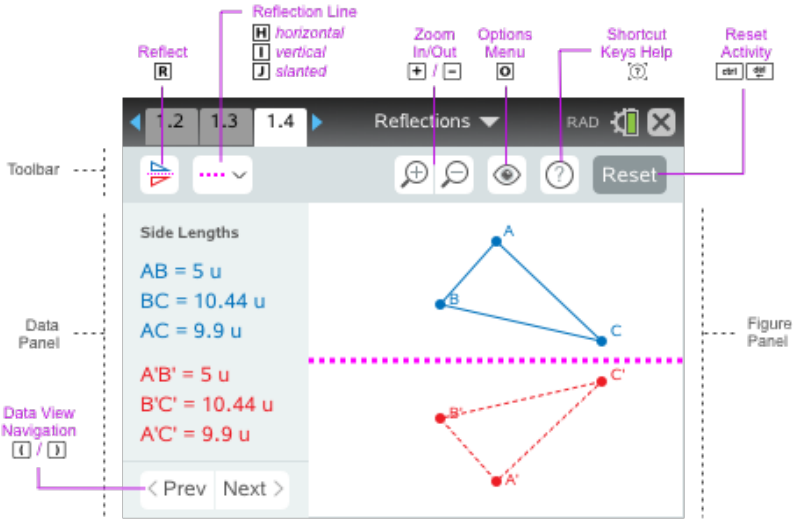
On the handheld, press ctrl ▶ and ctrl ◀ to navigate through the pages of the lesson.
On the iPad®, select the page thumbnail in the page sorter panel.

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 photograph and discuss your observations with your group.

Move to page 1.4. (ctrl ▶) Look at the figure below of an overview of the main reflections page and shortcut keys. ***Especially notice what the shortcut keys R, H, I, and J represent.***



R , O , + , − , ? , ctrl del , (,) (parentheses keys) are examples of **shortcut keys.**

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 tab to move to the next option or object on the screen and use shift tab to go to the previous option or object.
- Use a **shortcut key** (ex: A for vertex A, R to Reflect, etc.). Letters A, B, C 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 (tab) multiple times and notice each of the icons and points as they are highlighted. To go in the opposite direction, press shift tab. 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 ctrl trig). **Look at this list now.** Use as needed. Press enter or esc to close the Shortcut Keys Help menu.

4. To reflect ΔABC about a **horizontal line**, press the Reflect key. (click on or press R).

   Zoom in (+) or out (−) as needed. Observe what happens on the screen.

   ΔABC is called the pre-image and $\Delta A'B'C'$ is called the image. $\Delta A'B'C'$ is read “triangle A prime, B prime, C prime”. The pink dashed line is called the line of reflection.

5. To move and grab a vertex, press the letter key that corresponds to the vertex such as A (A), and use the directional arrows (▲▼◀▶) on the touchpad to move vertex A. Play and explore to discover ideas and investigate patterns. Grab and move vertex A (A) now.

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.)

Repeat for vertex B (B) and vertex C (C). Observe.

Move the vertices until one triangle is entirely on one side of the line of reflection.
Discuss with your partner or group: what appears to be true about the pre-image triangle and its image triangle?

Move one of the vertices to be on the line of reflection. Observe.

Move a second vertex to also be on the line of reflection. Observe.

Move one or more of the vertices and continue to observe.

6. Grab and drag the entire triangle shape by pressing the S key. Use the directional arrows to move the entire shape. (On the iPad®, tap on a side of the triangle (not a vertex) and slide the triangle.) Investigate and observe. What appears to be true about the pre-image and its image?

7. Reset the page with the current menu settings. Press Reset (ctrl del).

8. Change the line of reflection to a **vertical line** by using the appropriate shortcut key:

H Horizontal line I Vertical line J Slanted line

(On the iPad®, tap the Reflection Line dropdown menu icon and select the line of reflection.)

To reflect ΔABC about the line chosen, press the Reflect key. (click on  or press R).

Zoom  in (+) or out (−) as needed. Observe what happens on the screen.

Repeat steps 5 – 6 above using this vertical line of reflection.

9. Reset the page with the current menu settings. Press Reset (ctrl del).

   Change the line of reflection to a **slanted line** by using the appropriate shortcut key:

   H Horizontal line I Vertical line J Slanted line

   (On the iPad®, tap the Reflection Line dropdown menu icon and select the line of reflection.)

   Reflect ΔABC about the line chosen (click on  or press R). Observe what happens on the screen.
   Repeat steps 5 – 6 using this slanted line of reflection.

10. Now investigate what happens when the line of reflection is moved.

    On the handheld, press menu, 2 for Reflection Method, then press 2 for Movable Line.

    (On the iPad®, tap the wrench and select Reflection Method, then Movable Line.)

    To reflect ΔABC about the line chosen, press the Reflect key. (click on  or press R).

    The line, $\overleftrightarrow{PK}$, can be moved in three different ways on the handheld:

    i. Grab and move point P (P). Observe. Grab and move vertices so that the pre-image triangle is entirely on one side of the line of reflection. Observe.

    ii. Grab and move point K (K). Observe. Grab and move vertices so that one or two of the vertices of the pre-image triangle are on the line of reflection. Observe.

    iii. Grab and move the line by pressing the letter L (L). Observe. Grab and move vertices. Observe.

11. Many different triangles have been reflected about several different lines.
    Based upon your observations, write several conjectures about what seems to be true about a triangle and its reflection about a line.
    A ***conjecture*** is an opinion or conclusion based upon what is observed.

12. In a reflection ΔABC is typically called the _____ triangle and $\Delta A'B'C'$ is typically called the _____ triangle.
    How is $\Delta A'B'C'$ read? _____