

Transformational Puppet

ID: 8180

Time required

45 minutes

Activity Overview

Students draw a puppet whose arms and legs are constructed by using a translation vector and reflection line. They will manipulate the vector and observe the changes in the puppet. This activity will help students visualize the effect of a transformation in their construction.

Topic: Transformational Geometry

- *Given a translation vector and a geometric figure, translate the figure to discover that lengths, angles, areas, shapes and parallel line segments are preserved under translations.*
- *Given a reflection line and a geometric figure, reflect the figure to discover that lengths, angles, areas and shapes are preserved under reflections and orientations are reversed.*

Teacher Preparation and Notes

- *Although this is a geometry activity, it can also be used in a Pre-Algebra or Algebra classroom.*
- *Before beginning this activity, students should be familiar with reflections and translations outside the coordinate plane. They should already know the terms associated with transformations, such as line of reflection and translation vector.*
- *This activity is designed to be explored individually or in pairs, with the teacher acting as a facilitator.*
- ***To download the student worksheet, go to education.ti.com/exchange and enter "8180" in the keyword search box.***

Associated Materials

- *TransformationalPuppet_Student.doc*

Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.

- *Handy Reflections (TI-84 Plus family) — 6798*
- *"Fishing for Points"—Transformations Using Lists (TI-84 Plus or TI-73 Explorer) — 8823*

Problem 1 – Constructing the puppet

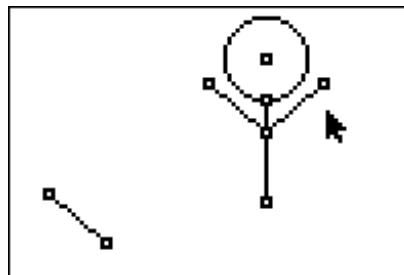
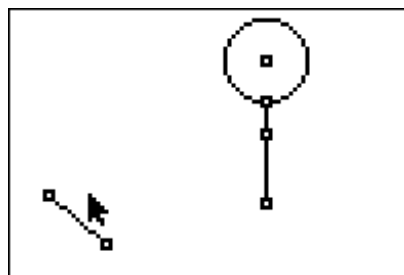
In *Cabri Jr.*, students will start with a new document.

They will use the **Circle**, **Segment**, and **Point On** tools to create the head, body, and shoulder, respectively.

Students *must* draw the segment for the translation vector in the order described on the worksheet (bottom right point, then top left point).

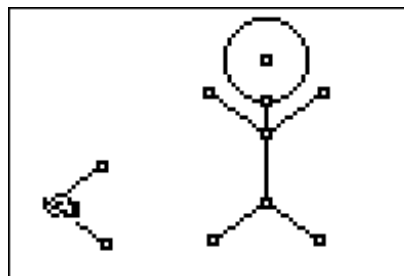
They are directed to use the **Translation** tool to create the left hand and then use the **Reflection** tool to create the right hand. Each point will need to be joined with a segment to the shoulder point.

Another segment to be used as the translation vector for the legs will be drawn with the first one. Again, students *must* draw the segment in the order described on the worksheet (top right point, then bottom left point).

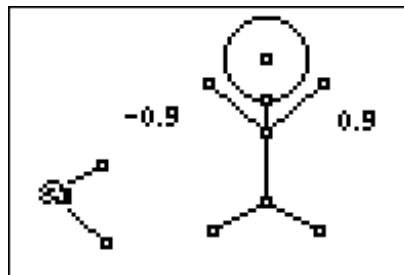


Problem 2– Moving the puppet

Students should drag the point joining the two translation vectors and observe the changes of the arms and legs.



To investigate the puppet further, students should use the **Slope** tool to find the slopes of the arms. Then they can drag the point on the left side of the screen and observe the changes.



Students can also find the coordinates of the left and right hands.

