

Reflections in Motion

by – Johanna Bowman

Activity overview

Students will observe relationships in reflected images that can be stretched vertically or horizontally.

Concepts

Triangles

Geometric analysis

Transformations

Teacher preparation

Load calculator activity on each student calculator. Have viewscreen or multi-media projector available for display and discussion.

Classroom management tips

Students can be grouped in pairs to enable peer assistance. Provide assessment rubric and explanation of expectations prior to activity.

TI-Nspire Applications

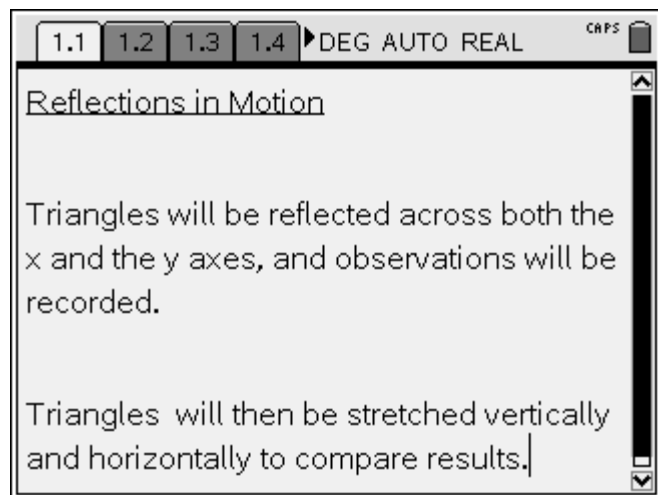
none

Step-by-step directions

Students will use the calculator activity to prepare to create a paper and pencil version of the Reflections.

There should be some discussion to review the properties of reflected figures and similar triangles.

Students should work at their own pace, individually or in pairs, with whole class discussion when necessary.



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Grade level: 8-10

Subject: Geometry

Time required: 45 to 90 minutes

Materials: TI-Nspire Calculator Activity

Students will learn to hide the axes and the circumscribed circle by using the Hide/Show function of the TI-Inspire.

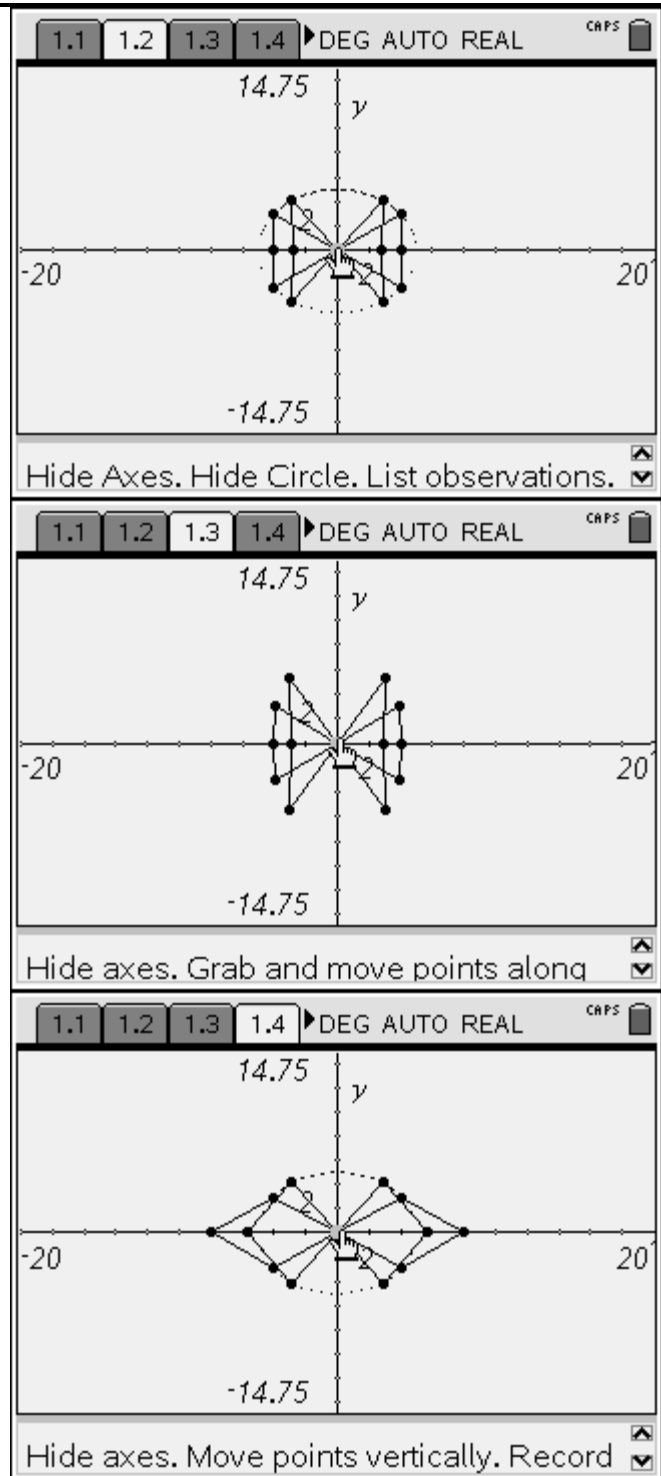
Students should write observations on paper to use in the final part of the activity.

Discussion should mention congruency of angles and proportional relationships of the corresponding segments.

With the circumscribed circle hidden, the students should grab and move the points along the horizontal axis and list their observations.

Depending on the length of the lesson, students can be encouraged to find the areas of the matching triangles, and compare the ratios of corresponding sides.

Students should move points vertically and make written observations of the corresponding triangles and images.



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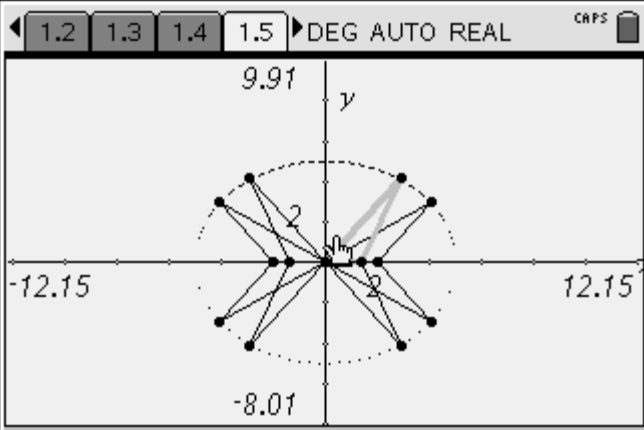
Grade level: 8-10

Subject: Geometry

Time required: 45 to 90 minutes

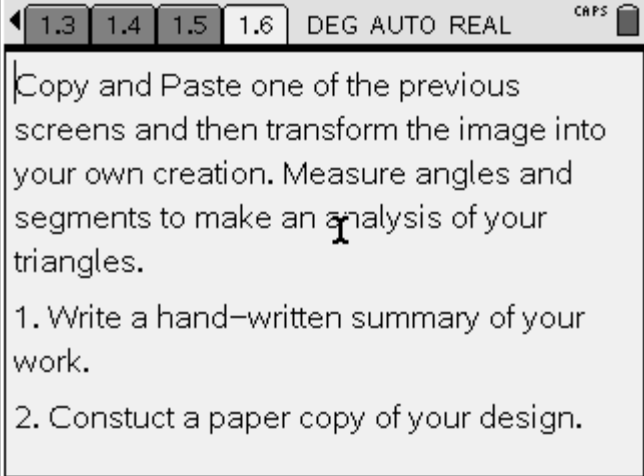
Materials: TI-Nspire Calculator Activity

Students should be encouraged to move the points at random and compare the corresponding relationships.



The calculator screen displays a coordinate plane with a circle centered at the origin. The x-axis has tick marks at -12.15 and 12.15. The y-axis has tick marks at 9.91 and -8.01. A circle is drawn with a radius of 2 units. Several points are plotted on the circle, and lines connect them to form a complex geometric shape. The calculator interface shows the menu bar with options 1.2, 1.3, 1.4, 1.5, DEG, AUTO, REAL, and CRPS. Below the screen, there is a text box with the instruction: "Hide axes. Move points at random."

Hide axes. Move points at random.



The calculator screen displays a text box with the following instructions: "Copy and Paste one of the previous screens and then transform the image into your own creation. Measure angles and segments to make an analysis of your triangles." Below the text box, there are two numbered steps: "1. Write a hand-written summary of your work." and "2. Construct a paper copy of your design." The calculator interface shows the menu bar with options 1.3, 1.4, 1.5, 1.6, DEG, AUTO, REAL, and CRPS.

At this point students should use the copy and paste feature of the TI-Nspire to add a final page to this document.

Each student should manipulate the figures to create a unique design. Measure angles and segments in order to transfer this design to a paper construction.

Make a paper copy of the design and write a hand-written summary of the properties of the reflected images.

Save the calculator document with an appropriate filename.

Assessment and evaluation

- *Students can return to the calculator activity and review their work. Paper constructions can be used to facilitate understanding.*

Activity extensions

- *Some students may be able to use the Animation feature of the TI-Nspire to create a visual display of the Reflections in Motion.*
- *A collection of reflected images from the real world may help students recognize the relationships.*
- *Mirrors can be used to produce reflected images and patterns.*

Student TI-Nspire Document
Reflections in Motion

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Materials: TI-Nspire Calculator Activity

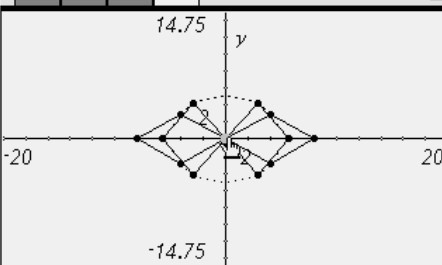
1.1 1.2 1.3 1.4 DEG AUTO REAL CAPS

Reflections in Motion

Triangles will be reflected across both the x and the y axes, and observations will be recorded.

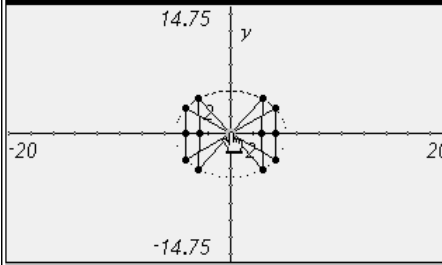
Triangles will then be stretched vertically and horizontally to compare results.

1.1 1.2 1.3 1.4 DEG AUTO REAL CAPS



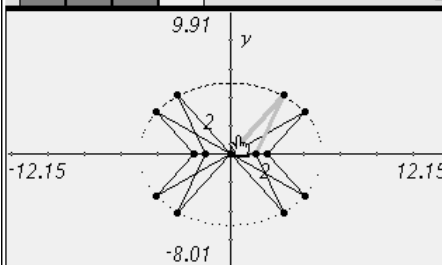
Hide axes. Move points vertically. Record

1.1 1.2 1.3 1.4 DEG AUTO REAL CAPS



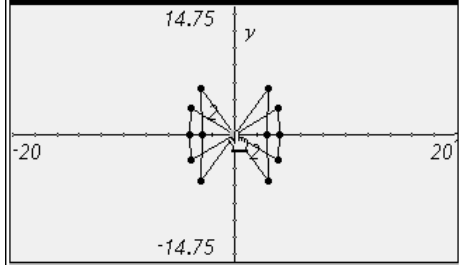
Hide Axes. Hide Circle. List observations.

1.2 1.3 1.4 1.5 DEG AUTO REAL CAPS



Hide axes. Move points at random.

1.1 1.2 1.3 1.4 DEG AUTO REAL CAPS



Hide axes. Grab and move points along

1.3 1.4 1.5 1.6 DEG AUTO REAL CAPS

Copy and Paste one of the previous screens and then transform the image into your own creation. Measure angles and segments to make an analysis of your triangles.

1. Write a hand-written summary of your work.
2. Construct a paper copy of your design.