

Crazy Kaleidoscope

Rotations Lesson
Transformations and Tessellations Unit
Geometry
Paula Brault

Time: One 45-minute classes

Lesson Overview:

Students will create a Kaleidoscope image by using Geometer's Sketchpad rotation and reflection tools. This lesson comes at about the midpoint of the Transformations and Tessellations Unit. Students will have already learned about translations.

Pre-requisite Knowledge:

Translations
Rotations
Reflections
Transformations with real-life applications
General computer use knowledge
Using Geometer's Sketchpad

Objectives:

Learn to construct a rotation and a reflection in Geometer's Sketchpad.
Reinforce translations, rotations, and reflections.

Materials Needed:

Instruction sheet (attached) Computer with Geometer's Sketchpad loaded Writing Implement

Important Vocabulary:

Translation- a transformation that moves points the same distance and in the same direction.

Transformation – a change in the position, size, or shape of a figure.

Reflection – a transformation that moves points equal distances from opposite sides of a line of reflection.

Rotation – a transformation that moves points a certain number of degrees counterclockwise.

Basic Computer Vocabulary such as edit, save, menu, copy, select, etc.

Procedure:

1. Have students begin away from the computers.
2. Hand out instruction sheet and read through directions, answer any questions that may arise.
3. Send students to the computers to begin.
4. Write the timetable for the class in a prominent location. If there is 40 minutes left to class, put current time, the time 20 minutes from the start, the time that would leave 5 minutes left, and the ending time. This allows students to stay on task to finish in a timely manner.
5. Walk around the classroom answering questions, providing assistance, and making sure that students are on track. Good questions to ask the students are, "What did you notice when..." or "What happened when..." These questions are based on issues that might come up because of a lack of following directions or an "aha" moment where something worked great.
6. With five minutes remaining in class, ask students to save their work and log out if necessary. Have a short discussion about where they see reflections in life that are not a kaleidoscope or a mirror. Remind students they may be asked questions about this project on a future quiz.

Watch Out!

1. Students tend to ignore the directions and get lost when using Geometer's Sketchpad. If this happens, suggest they use "undo" in the edit menu until they get back to the last place they followed the directions exactly. Students new to this program may need assistance doing this.
2. Students tend to lose track of time, keep them on track with timing reminders.
3. Students sometimes feel that computer lab time is play time. Remind them that this is class work worth 20 points.

Curriculum Standards

This unit covers the following Massachusetts State Frameworks:

G.G.1, G.G.3, G.G.4, G.G.6, G.G.11, G.G.12, G.G.15

This unit also applies to the following Student Expectations from the PVRs Mission Statement:

A1, A3, B1, B2, B3

Follow Up:

The next step in this unit is dilations. If students have finished the required part of this assignment and would like to go on, they can play with making several of the shapes smaller or larger and see what happens. This is a good segway into dilations.

Assessment:

See attached rubric of the lesson. Students can expect to see questions on future quizzes regarding this activity.

Resources:

Adapted from an activity in Prentice Hall Geometry For the Real World.

Crazy Kaleidoscopes Rubric

Score	Behavior	Tasks Completed	Quality of Tasks	Challenges Completed
5	On task the entire class, not spoken to about behavior	All basic tasks are completed	At least five polygons are reflected and there is at least two that are not "regular" polygons.	Challenge Questions are both complete
4	Primarily on task, spoken to once about behavior	No color is included	Four polygons, two not regular	NA
3	Spoken to twice about behavior	No color is included and only two lines of reflection	Three polygons, one not regular	One challenge question is complete
2	Spoken to three times about behavior	No color is included and only one line of reflection	Two polygons, one not regular	NA
1	Asked to be removed from the computers	No color, one line of reflection, and no reflections	Two polygons, no irregular polygons	NA
0	Asked to leave the room	Not completed	Not completed	Not completed