

MA.2.GR.1.3

Overarching Standard: MA.2.GR.1 *Identify and analyze two-dimensional figures and identify lines of symmetry.*

Benchmark of Focus

MA.2.GR.1.3: Identify line(s) of symmetry for a two-dimensional figure.

Example: Fold a rectangular piece of paper and determine whether the fold is a line of symmetry by matching the two halves exactly.

Benchmark Clarifications

Clarification 1: Instruction focuses on the connection between partitioning two-dimensional figures and symmetry.

Clarification 2: Problem types include being given an image and determining whether a given line is a line of symmetry or not.

Related Benchmark/Horizontal Alignment

- MA.2.FR.1.1/1.2
- MA.2.M.2.1

Vertical Alignment

Previous Benchmarks

MA.1.GR.1.3

Next Benchmarks

MA.3.GR.1.3

Terms from the K-12 Glossary

- Line of symmetry
- Hexagon
- Polygon
- Pentagon
- Rectangle
- Square
- Triangle

Purpose and Instructional Strategies

The purpose of this benchmark is to introduce the concept of line symmetry in two-dimensional figures.

- Instruction includes the ideas that a line of symmetry decomposes a figure into mirror images.
 - Instruction explores line symmetry through familiar figures such as triangles, rectangles, squares, pentagons, hexagons and octagons, but is not limited to polygons.
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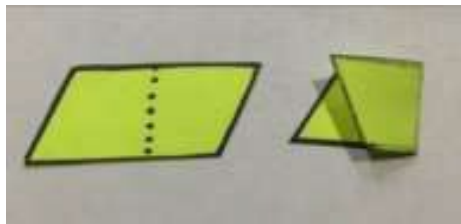
Common Misconceptions or Errors

- Students may assume a figure has the same number of lines of symmetry as sides or that a figure with more sides has more lines of symmetry.
- Students may assume all diagonals are lines of symmetry.
- Students may think two halves will always create a line of symmetry.
- Students may think all figures have a line of symmetry.

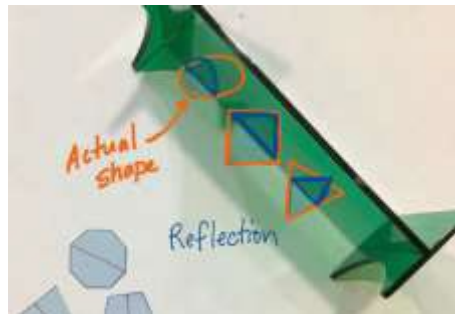
Strategies to Support Tiered Instruction

- Teachers provides instruction on why the lines shown on a rectangle and a parallelogram are not lines of symmetry and gives students die cut shapes. Students fold the paper along these lines to demonstrate the non-example. Teacher provides additional practice drawing lines of symmetry on two-dimensional figures and testing to see if each is a line of symmetry. Students may also record their work in writing on paper or in a journal.

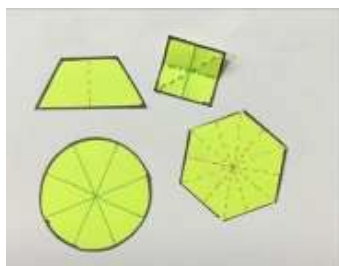
- Example:



- Teacher provides instruction on identifying lines of symmetry using die cuts. Students fold the die cut shape to locate and draw lines of symmetry. Teacher clarifies the meaning of symmetry and how this differs from equal parts and explains that a line of symmetry is an imaginary line that divides a figure into two parts, each of which is the mirror image of the other.
 - For example, the teacher provides mirrors and have students use the mirrors to determine if a line drawn is a line of symmetry.



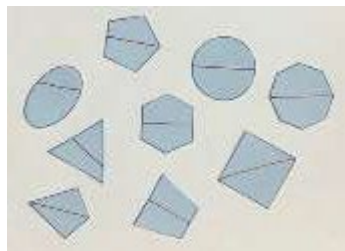
- Teacher provides sheets of paper. Students fold paper shapes into two matching parts to identify lines of symmetry using only shapes that have them. Students may trace the lines of symmetry onto the unfolded paper.
 - For example, teacher may ask, "Which shapes had lines of symmetry, and which did not? How do you know?"



- Teacher provides geoboards to students with six rubber bands. Teachers dictate which shape should be made on the geoboard and models the first line of symmetry. Students work with the rubber bands to find the rest of lines of symmetry. Students draw the examples on a piece of paper.
- Teacher provides sheets of paper. Students fold paper shapes into two matching parts to identify lines of symmetry. Include shapes that do not have lines of symmetry. Students trace the lines of symmetry onto the unfolded paper.
 - For example, teacher asks, “Which shapes had lines of symmetry, and which did not? How do you know?”



- Teacher provides geoboards to students along with six rubber bands. The teacher makes a shape that has no line of symmetry on the geoboard. Students work with rubber bands to determine the lines of symmetry. Teacher engages in discussion with students about why they cannot find a line of symmetry.
- Teacher provides additional practice through a symmetry sort by preparing cards that each show a two-dimensional figure with a line drawn on the figure. Some show a line of symmetry while others do not. Students sort figures into those that show a line of symmetry and those that do not.
 - For example, the teacher asks students to compare answers with a partner and reconcile any differences by tracing the figure and folding along its line.



- Teacher provides instruction on the concept of line symmetry. Using one shape, students are shown examples and non-examples of lines of symmetry, emphasizing that they divide a figure into two parts that are mirror images of each other. Teacher also provides students with paper shapes that can be folded along a given line to determine if the line is a line of symmetry.

Questions to ask students:

- **Point to a shape and ask if it has any lines of symmetry. Have the student explain how they know.**
 - Sample answer that indicates understanding: *This shape has 1 line of symmetry because if I fold the shape here, it makes two halves that match exactly, like mirror images.*

- **Point to a rectangle and ask if the diagonal is a line of symmetry. Have the student explain their thinking.**
 - Sample answer that indicates understanding: *That is not a line of symmetry because if I fold it over the that line, the shapes do not match up.*
- **Point to a shape that has multiple lines of symmetry. Ask the student to identify how many lines of symmetry they can find in the shape.**
 - Sample answer that indicates understanding: *This is a square and it has 4 lines of symmetry. I can fold it in half two ways and then across two ways. Every time I fold it, it creates two sides that are exact matches or mirror images, that's how I know they are lines of symmetry.*

Instructional Tasks

Instructional Task 1

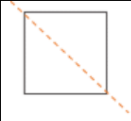

Provide students with cut outs of various two-dimensional figures.

- Part A: Show how a fold will or will not create a line of symmetry.
- Part B: Record your findings to identify patterns you notice about lines of symmetry in certain figures.

Instructional Items

Instructional Item 1

Look at the figures below. Choose **yes** or **no** to determine whether the line drawn is a line of symmetry?

	yes	no
	yes	no

Additional Resources:

[CPALMS Resources](#)

[Video: Identify line symmetry in regular polygons](#) (please note students do not need to know the vocabulary: equilateral triangle)

Resources/Tasks to Support Your Child at Home:

Look for real-world shapes in books, around your home or in the newspaper that have one or more lines of symmetry. Ask your child to explain how they know they are lines of symmetry.

Khan Academy Video: [Identifying Symmetrical Figures](#)

Kahn Academy Practice: [Identify Line Symmetry](#)