

MA.3.GR.1.1

Overarching Standard: MA.3.GR.1: Describe and identify the relationships between lines and classify quadrilaterals.

Benchmark of Focus

MA.3.GR.1.1: Describe and draw points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines. Identify these in two-dimensional figures.

Benchmark Clarifications

Clarification 1: Instruction includes mathematical and real-world context for identifying points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines.

Clarification 2: When working with perpendicular lines, right angles can be called square angles or square corners.

Related Benchmark/Horizontal Alignment

- MA.3.GR.2.4
- MA.3.DP.1.1

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.2.GR.1.1	MA.4.GR.1.1
	MA.4.GR.1.2

Terms from the K-12 Glossary

- Line
- Parallelogram
- Rectangle
- Square
- Triangle

Purpose and Instructional Strategies

The purpose of this benchmark is to build important vocabulary that allows students to describe and draw points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines, and to identify examples in two-dimensional figures represented in mathematical and real-world contexts. In Grade 2, students were expected to identify and draw two-dimensional figures based on their defining attributes. In Grade 3, students can describe and draw geometric figures using more formal vocabulary developed in this benchmark.

Therefore, instruction of this benchmark relies heavily on vocabulary development for students to internalize definitions and make connections between the concepts. In Grade 4, students will explore and draw angles beyond square angles.

- In mathematical contexts, students find evidence of points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines in models of two-dimensional figures (e.g., quadrilaterals, triangles). In real-world contexts, students identify evidence of these geometric attributes in real-life images (e.g., aerial views of city maps, photos of objects) (MTR.4.1, MTR.7.1).
- This vocabulary development will be necessary as students identify and draw quadrilaterals based on their defining attributes (MA.3.GR.1.2). It will also be beneficial in other areas as students begin to read, draw and understand graphs and diagrams.
- Instruction should also consider activities that encourage student discussions rich in mathematical reasoning opportunities. Mathematical discussions and reasoning activities give students the practice necessary to use the vocabulary and internalize it in meaningful ways. An example of a mathematical reasoning activity that builds vocabulary understanding is in the instructional task below (MTR.4.1).
- Two additional notes about instruction of this benchmark:
 - Images of figures used in instruction should not include hatch marks.
 - Because formal instruction of angle measurements does not begin until Grade 4, students can refer to right angles in perpendicular lines as “square angles” or “square corners.”

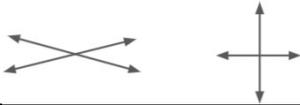
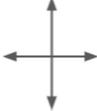
Common Misconceptions or Errors

- Students can confuse some pairs of intersecting lines as perpendicular. Encourage students to justify their thinking whenever they reason about geometric concepts. For example, students can use the corners of a standard sheet of paper as a comparison to determine whether a pair of intersecting lines is perpendicular.
- Students may struggle to identify examples of points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines in real-world examples. Classroom instruction should include many examples for students to explore.

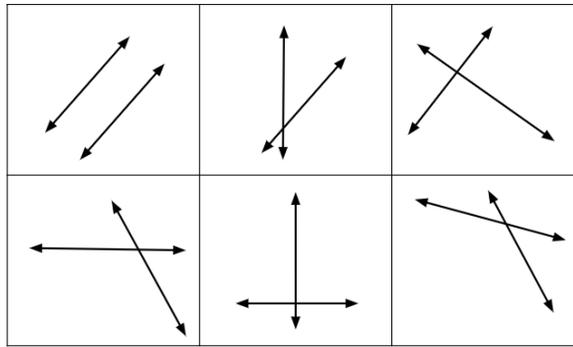
Strategies to Support Tiered Instruction

- Instruction provides opportunities to justify thinking when reasoning about geometric concepts.

- For example, the teacher demonstrates how to use the corners of a standard sheet of paper as a comparison to determine whether a pair of intersecting lines is perpendicular.
- Instruction includes the use of key vocabulary, referencing definitions for terms such as intersecting lines, right angle, and perpendicular lines. The teacher draws examples of intersecting lines that are both perpendicular and not perpendicular and has students explain which they are and justify their reasoning.
 - For example, teachers provide key vocabulary as shown below for students to refer to. The teacher will then draw sets of lines, some that do not intersect, some that intersect but do not create right angles, and other sets that do create right angles. Students determine which pairs of intersecting lines can be classified as perpendicular and explain why.

	Definition	Example
Intersecting Lines	Lines that cross.	
Right Angle	An angle that measures exactly 90 degree or forms a square corner.	
Perpendicular Lines	Lines that cross and form right angles.	

- The teacher provides a tool such as a square tile or the corner of a piece of paper to identify intersecting lines that create right angles and classify those as perpendicular lines and those that do not form right angles as intersecting but not perpendicular. Students use the tool to draw some of their own intersecting lines that would be examples of both.
 - For example, the teacher may provide students with a graphic organizer like the one shown below and a set of cards with pairs of lines (examples shown below). The students use the tool to sort the cards into perpendicular and not perpendicular and draw at least one pair of their own lines for each category.



Intersecting Lines	
Not Perpendicular	Perpendicular

- Instruction includes real-world examples of points, lines, line segments, rays, intersecting lines, perpendicular lines, and parallel lines. The teacher provides images of real-world examples that include geometric figures. Students identify the geometric figure in the example.
 - For example, the teacher provides an image of railroad tracks to represent parallel lines, a speed sign to represent perpendicular lines, a balance beam to represent a line segment, and other common images.
- Instruction includes real-world examples of points, lines, line segments, rays, intersecting lines, perpendicular lines, and parallel lines. The teacher points out items in the classroom that are examples of the geometric terms listed above and has students identify which term it is an example of.
 - For example, if the teacher points out a poster with the number one or the letter l on it, students will say it represents a line segment. If the teacher points out the window, students will say the top and bottom of the window shows parallel lines, while the corners of the window show perpendicular lines.
 - For example, students to find their own examples within in the classroom and explain which geometric term they notice in the figure.

Questions to ask students:

- **Explain the difference between a line, a line segment and a ray.**
 - Sample answer that indicates understanding: *A line is a straight set of points that has no thickness and extends forever in both directions*
 - 2. *A line segment is part of a line that connects two points*
 - 3. *A ray is a line that starts at a point and goes on forever in one direction.*
 - Sample answer that indicates an incomplete understanding or a misconception: *The students confuses the types of lines or has incomplete definitions.*
- **What is an example of parallel lines in your classroom? What is an example of perpendicular lines in your classroom? What attributes make them parallel or perpendicular?**
 - Sample answer that indicates understanding: *The border on the bulletin board (the top and bottom layer) are parallel because they will never intersect or cross paths. The side border and bottom border of the bulletin board are perpendicular because they cross paths and create a 90 degree angle.*
- **Does a square have parallel or perpendicular lines? If so, then identify them.**
 - Sample answer that indicates understanding: *Student identifies that a square has two pair of parallel lines and four pairs of perpendicular lines and can point them out on a square.*
 - Sample answer that indicates an incomplete understanding or a misconception: *The students only identifies one set of lines.*

Instructional Tasks

Instructional Task 1

Are intersecting lines always, sometimes, or never parallel? Show your thinking.

Instructional Task 2

Are intersecting lines always, sometimes or never perpendicular? Show your thinking.

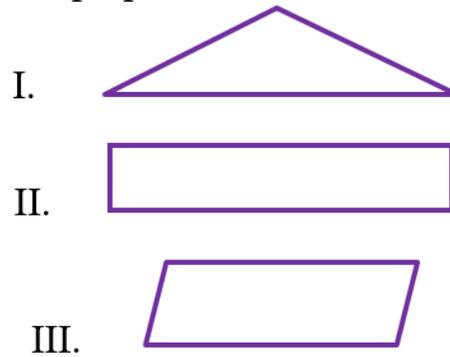
Instructional Task 3

Draw a geometric figure with parallel and perpendicular sides

Instructional Items

Instructional Item 1

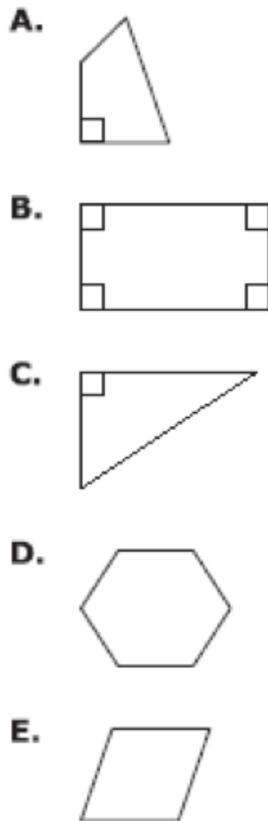
Which of the following figures show perpendicular lines?



- a. I only
- b. II only
- c. II and III
- d. I, II and III

Instructional Item 2

38. Which **three** shapes appear to have at least two parallel sides?



Benchmark		Context	Assessment Limits
<p>MA.3.GR.1.1 Describe and draw points, lines, line segments, rays, intersecting lines, perpendicular lines, and parallel lines. Identify these in two-dimensional figures.</p> <p>Clarification 1: Instruction includes mathematical and real-world context for identifying points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines.</p> <p>Clarification 2: When working with perpendicular lines, right angles can be called square angles or square corners.</p>		Both	<p>Items with two-dimensional figures will not include hatch marks representing sides of equal lengths, arcs representing angles of equal measure, or arrows indicating parallel lines/sides.</p> <p>Items will not use the word "congruent."</p>
ALD 2	ALD 3	ALD 4	ALD 5
identifies points, lines, line segments, rays, intersecting lines, and perpendicular and parallel lines.	draws points, lines, line segments, rays, intersecting lines, and perpendicular and parallel lines; identifies these in two-dimensional figures.	describes and draws points, lines, line segments, rays, intersecting lines, perpendicular lines, and parallel lines; identifies these in two-dimensional figures.	N/A

Additional Resources:

- [CPALMS Resources](#)
- [Draw Points, Lines, and Line Segments](#)
- [Identify Parallel, Intersecting, and Perpendicular Lines](#)
- [Acute, Right, and Obtuse Angles](#)

Resources/Tasks to Support Your Child at Home:

Look for examples of the different types of lines in the real-world on the playground, around your home or in books or magazines. Could extend and have your child draw the examples in a journal.

[Parallel and Perpendicular Lines Video](#)

Identify angles in the real-world environment: As you are in your home, driving, at a store... look for examples of acute, right and obtuse angles. Extend to have your child record and draw the examples of each angle found.

[Drawing Acute, Right and Obtuse Angles](#)