Draw, Name, and Spot Lines and Angles

Teacher		**Class**	Grade 4
Subject	Math	**Topic**	Lines and angles
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn to draw points, rays, segments, lines and three angle types. They work in pairs to draw from directions and spot them in 2D figures.

Curriculum links

- Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. [1]

Learning objectives

- Students will draw points, lines, line segments, rays and angles accurately with a ruler.
- Students will classify angles as right, acute or obtuse by comparing to a square corner.
- Students will identify parallel, perpendicular and intersecting lines in two-dimensional figures.

Success criteria

- I can draw a point, line, segment, ray and each angle type.
- I can sort angles as acute, right or obtuse using a corner tester.
- I can label parallel and perpendicular sides in 2D figures.

What students already know

2-minute whiteboard check: draw a dot, draw a straight path, and point to a book corner that looks square.

Key words

ray	a straight path that starts at a dot and keeps going one way only [13]
acute angle	a sharp opening smaller than a square corner, less than 90 degrees [10]
right angle	an opening exactly 90 degrees, like a book corner with a tiny square mark [6][10]
obtuse angle	a wide opening bigger than a square corner but smaller than a straight line [10]
parallel lines	two straight paths that stay the same distance apart and never cross [6]
perpendicular lines	two straight paths that cross to make a square corner [6]

Materials

- paper
- pencils
- rulers
- direction cards
- paper corner testers made from index cards
- Slides 2, 4, 6-7, 9-12

Before the lesson

- Print direction cards for pairs and Worksheet Task D copies for pairs
- Test Slide 6 Video clip 1 (0:00–2:36) for picture and sound
- Set out rulers, paper, pencils and paper corner testers
- Load Slides 2, 4, 6-7, 9-12 for display

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- Video clip 1 (0:00–2:36) - Lines, Rays, and Angles - Grade 4
- Worksheet Task D copies - Spot parallel and perpendicular lines in shapes
- mini whiteboards and markers

Lesson outline

0–5 min **Starter** 5 min · Whole class

To hook interest in drawing from words and recall what students know about lines and square corners.

YOU DO

1. Welcome the class and say the hook line, asking students to close eyes and picture the words.
2. Show Slide 2 mystery and read the riddle about running side by side and never meeting.
3. Take answers and confirm parallel lines that stay the same distance apart.
4. Ask who has seen a book corner square mark and what it tells us.

STUDENTS DO

1. Close eyes, listen, and imagine the drawing.
2. Call out guesses for the riddle and explain thinking.
3. Show thumbs up if they have used a ruler to draw straight paths before.

Say: Close your eyes and picture my words. Can you draw exactly what you hear? Today we will draw lines and angles from directions. First, solve this riddle: I run side by side and never meet. What am I?

Ask: I run side by side and never meet. What am I? (Parallel lines that stay the same distance apart) · What does the tiny square in a corner tell us? (It is a right angle, exactly 90 degrees, like a book corner [6][10])

Check understanding: Show of hands for parallel answer and whiteboard dot drawing; reteach dot for point if dots are large circles.

Support: Let students sit and trace two pencils held apart to feel side-by-side paths that never meet. **Stretch:** Ask students to predict how a ray could be different from a line segment before teaching.

Use: Slide 2

5–17 min **Teaching** 12 min · Whole class

To model how to draw points, segments, rays, lines and three angle types.

YOU DO

1. Display Slides 4, 6-7 and model each draw with a ruler on the board.
2. Play Video clip 1 (0:00–2:36) and tell students to listen for point, line, segment, ray and how two rays meet.
3. Explain that an angle is two rays sharing one starting point, the vertex [13].
4. Model the paper corner tester to test right, smaller and wider openings.

STUDENTS DO

1. Watch, name each figure as point, line, segment, or ray and note arrows.
2. Watch the video and raise a finger when they hear vertex or ray.
3. Practice testing printed angles with their paper corner.

Say: A point is shown as a small dot. A line segment has two endpoints and stops. A ray starts at one dot and goes one way only, and a line goes both ways with arrows [13]. Two rays with the same endpoint make an angle [13]. We test it with a square corner.

Worked example: I do: Make a dot and label it A. That is a point. Join A to B with a ruler. That is a line segment with two endpoints. Start at C, draw through D with one arrow past D. That is a ray. Draw through E-F with arrows both ends. That is a line. Join two rays at V, test with corner: fits exactly is 90 degrees and right, smaller is acute less than 90 degrees, wider but not straight is obtuse more than 90 degrees but less than 180 degrees [10].

Ask: How is a ray different from a line segment? (A ray has one endpoint and goes one way only; a segment has two endpoints and stops [13]) · How do you know an angle is acute? (The opening is smaller than the square corner, less than 90 degrees [10])

Check understanding: Mini whiteboards: draw a ray with one arrow and hold up; reshow endpoints and arrows if many add two arrows.

Support: Give pre-drawn dots for endpoints so students only focus on adding straight paths and arrows.
Stretch: Ask students to combine two pieces to start an angle shape and name each side as ray or segment.

Use: Slides 4, 6-7, Video clip 1 (0:00–2:36)

17–37 min **Main activity** 20 min · Pairs

To practice drawing and naming figures accurately from spoken directions in pairs.

YOU DO

1. Pair students as Student A reader and Student B drawer and hand out direction cards, paper, pencils and rulers.
2. Model Card 3: read aloud, think aloud, draw two rays from one dot, then label.
3. Start pairs on Cards 1-5: Card 1 Draw a point and label it. Draw a line segment with two endpoints. Card 2 Start at a dot and draw a ray that goes one way only with one arrow. Card 3 Draw two rays with the same endpoint to make an acute angle. Card 4 Draw a pair of parallel lines that never meet. Card 5 Draw a pair of perpendicular lines that cross at a right angle. Add the small square.
4. Stop halfway to swap roles and display Slide 9 to guide finishing, trading and labeling.

STUDENTS DO

1. Take turns reading a card and drawing with a ruler, adding arrows and endpoint dots.
2. Compare drawing to card, label point, line, segment, ray, angle, parallel or perpendicular.
3. Trade papers with another pair and check labels, adding the small square for right angles [6].

Say: Student A, read the card exactly. Student B, draw exactly what you hear with your ruler. Then compare to the card and label each part. Put the tiny square on any square corner. Drawing and identifying these lines and angles matches Grade 4 work [1].

Worked example: Card 4: I read Draw a pair of parallel lines that never meet. I draw two straight paths with a ruler, same distance apart, no crossing even if longer [6]. I add matching arrow marks to show they are paired. Partner checks with ruler edge that distance stays the same.

Ask: How do you show a line keeps going even if paper stops? (Add arrows on the ends; one arrow for ray, two arrows for line [13]) · How do you prove lines are perpendicular, not just crossing? (They cross at a right angle, the paper corner fits exactly with a square mark [6])

Check understanding: Collect one pair drawing per table and check labels and squares; replay one card whole-class if arrows or squares are missing.

Support: Provide sentence frames and a word bank with small pictures, and remind students that parallel lines in the word have two side-by-side lines like the letter l pair to help remember [11]. **Stretch:** Student A adds a 2D figure clue, like add a triangle side that is perpendicular to the first line, for Student B to complete.

Use: Slide 9

37–50 min **Practice** 13 min · Pairs

To identify parallel, perpendicular and angle types in two-dimensional figures.

YOU DO

1. Display Slide 10 and compare parallel that never cross even if longer with perpendicular that cross to make a square corner [6].
2. Hand out Worksheet Task D and model on a rectangle: trace opposite sides that stay apart as parallel.
3. Release pairs to spot parallel and perpendicular lines in shapes and mark acute, right and obtuse angles in color.
4. Circulate with paper corner testers to confirm square-corner checks.

STUDENTS DO

1. Trace shape sides with rulers and mark parallel pairs with matching arrows.
2. Place paper corner in each angle to label acute, right with square, or obtuse.
3. Complete Worksheet Task D and explain two choices by comparing to the square corner.

Say: Look at each shape side by side. Sides that stay the same distance apart and never meet are parallel. Sides that cross to make a square corner are perpendicular [6]. All perpendicular lines cross, but not all crossing lines are perpendicular [11]. Color the openings and test them.

Worked example: Rectangle: top and bottom are the same distance apart and never meet, so parallel; left and right are parallel. Top meets side at 90 degrees, paper corner fits exactly, so perpendicular with square mark [6]. Four angles are right. Triangle sample: one square corner is right, two smaller openings are acute less than 90 degrees [10].

Ask: Are these two non-touching slanted sides always parallel? (Only if they stay the same distance apart and would never meet if longer [6]) · Why is this wide angle obtuse, not acute? (The opening is wider than the square corner, more than 90 degrees but less than 180 degrees [10])

Check understanding: Hold up one finger for parallel, crossed fingers plus square signal for perpendicular; reteach with two pencils if mixed.

Support: Start with just rectangle and square and let students place the paper corner inside each angle to see fits exactly, hides, or has extra space [11]. **Stretch:** Draw their own quadrilateral with at least one right angle and one pair of parallel sides, then trade to check.

Use: Slide 10, Worksheet Task D

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50–60 min **Plenary** 10 min · Whole class

To review drawings and check all students can name lines and angles.

YOU DO

1. Run Slide 11 vote on where we find most right angles and tally windows, books and floor tiles.
2. Run Slide 12 true or false, asking students to justify with corner tester or ruler.
3. Give 3-question exit ticket on mini whiteboards and collect answers.
4. Link back to success criteria and set homework.

STUDENTS DO

1. Vote, discuss where square corners appear, and defend true or false choices.
2. Answer exit ticket on whiteboards and self-check against I can statements.
3. Tidy materials and note homework.

Say: Show me what you learned. Vote, then prove true or false with your tester. A line segment has two endpoints and stops at both ends. Only square-corner crosses count as perpendicular. An obtuse opening looks wide.

Ask: A line segment has two endpoints. True or false? (True. It stops at both ends.) · All crossing lines are perpendicular. True or false? (False. Only square-corner crosses count; all perpendicular cross but not all crossing are perpendicular [11])

Check understanding: Whiteboard exit ticket answers; pull small group for redraw if ray arrows or angle sorting are wrong.

Support: Allow desk models with two pencils to show endpoints and direction for ray questions. **Stretch:** Ask students to freeze arms to show parallel with a partner and perpendicular that forms a square corner.

Use: Slides 11–12

Common mistakes

Mistake	How to spot it	How to fix it
Judging acute or obtuse by length of side lines, not opening size	Labels long-ray angles as obtuse and short-ray angles as acute	Turn cutout to line up one side with card edge and compare opening only; it is size of opening that matters, not line length [11]
Calling any non-crossing lines parallel	Marks slanted sides that would meet if extended as parallel	Check with ruler that distance stays the same and extend with dotted lines to see if they would meet; parallel never touch even if longer [6]
Thinking all intersecting lines are perpendicular	Marks any X-cross as perpendicular without testing corner	Test with square corner and add tiny square only if exactly 90 degrees; perpendicular is a special intersecting case [11]

Support

- Provide sentence frames and a word bank with small pictures, and remind students that parallel lines in the word have two side-by-side lines like the letter I pair to help remember [11].
- Give dot stickers for endpoints and paper corner testers to focus on direction and opening size.
- Pre-teach vocabulary with arm and pencil models for ray that goes one way only [13].

Stretch

- Student A adds a 2D figure clue, like add a triangle side that is perpendicular to the first line, for Student B to complete.
- Challenge students to build a rectangle and triangle and point out parallel sides and right angles.
- Ask students to hunt for both parallel and perpendicular sides in one shape and explain how they know.

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For the LSE or teaching assistant

Support two target pairs during main drawing: read cards aloud, guide ruler use, and prompt corner tester checks for right angles.

Check for understanding

Question	Answer
Draw a ray. How many endpoints and arrows does it have?	One endpoint and one arrow going one way only [13]
Is an opening smaller than a square corner acute, right or obtuse?	Acute, less than 90 degrees [10]
In a rectangle, which sides are parallel and which meet as perpendicular?	Opposite sides are parallel; adjacent sides meet at right angles, so perpendicular [6]

Homework

Complete Worksheet Task B: Practice naming lines and angles.

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