

MYSTERY PICTURE

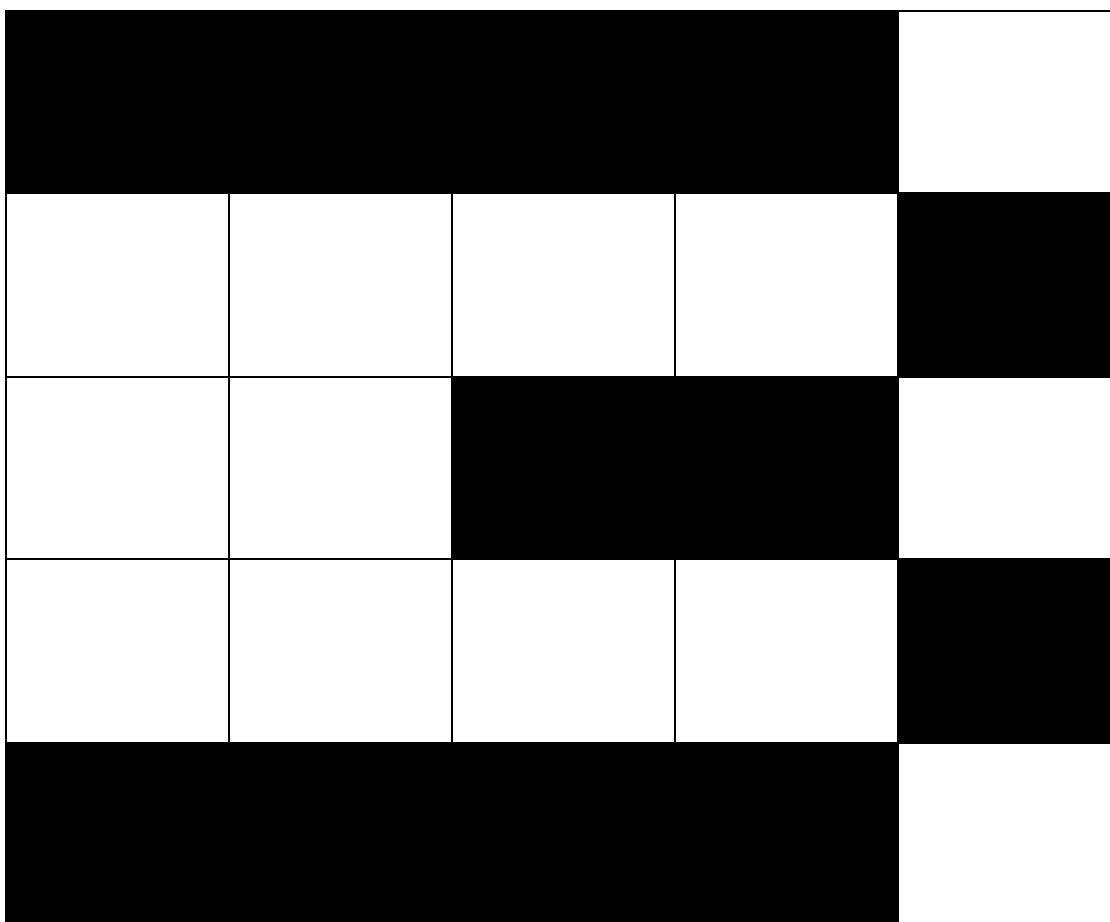


PARALLEL LINES, TRANSVERSALS AND ANGLE PAIRS

Transversals: which side is it on?

No numbers · no names to remember · wrong answers show in the picture

FREE



1. **Hand out page 3.** That is the whole preparation.
2. **Say this once:** “*The transversal is the line that runs through both crossings. Put your pencil on it. Ask whether the two arcs are on the same side of it.*”
3. **Opposite sides of the transversal? Fill the square. Same side? Leave it white.** A picture appears. 12 of the 25 squares are filled.

Student sheet	page 3, one per student. It carries the question as four pictures.
Answers	page 4 — the finished picture and what every square is.

Nothing on this sheet is named and nothing is measured. Each of the five names is made of two questions. This sheet asks only the first one, twenty-five times: are the two angles on the same side of the transversal, or on opposite sides? Weaker students need this step, and worksheets often skip it. A student who can do it is ready to tell *alternate* from *same-side*. A student who cannot now knows exactly what to practice.

10 of the 25 have no arrowheads, and the answer is no different. Which side of the transversal an angle is on is a fact about where it is. It does not depend on whether the lines are parallel, and *parallel* is not part of any of the five names. Say this when a student asks. That question holds the whole lesson.

No two squares are at the same slope and no line on the sheet is horizontal. This is on purpose. A student who thinks *same side* means *both on the left of the page* can do a usual worksheet perfectly. That student gets squares wrong here, and this is how you find out.

The picture does the marking, so you collect nothing. If one square is wrong, part of the shape is missing or does not fit, and the student sees it from their own desk. The student sheet says so, and says what to do.

Why the sheet says slanted lines and not “color it in”. 12 squares of pencil shading come out pale gray, and pale gray does not survive a school copier. Slanted lines do, they are faster, and the drawing stays readable underneath, so a square can be checked again.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.
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Mystery Picture

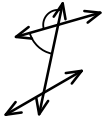
Which side of the transversal?

Name _____

Period _____

Date _____

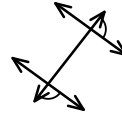
The transversal is the line through both crossings. Two arcs on opposite sides of it? Fill the square with slanted lines. Same side? Leave it white. A picture appears. If it does not look right, one square is wrong.



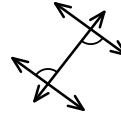
SAME side: leave white



OPPOSITE sides: fill



SAME side: leave white



OPPOSITE sides: fill

1 	2 	3 	4 	5
6 	7 	8 	9 	10
11 	12 	13 	14 	15
16 	17 	18 	19 	20
21 	22 	23 	24 	25

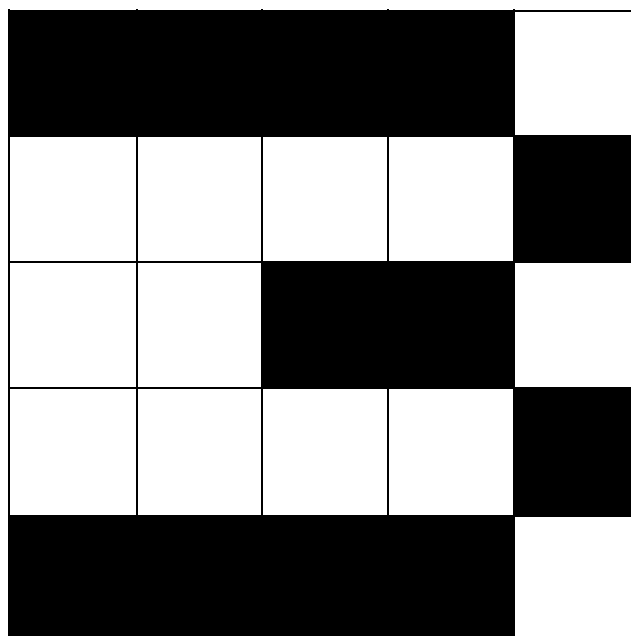


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Mystery Picture — answers

For the teacher

The finished sheet. **12 of the 25 are filled.** The table below names the two marked angles of each square: 1 to 4 at the upper crossing and 5 to 8 at the lower, each in the order upper left, upper right, lower left, lower right. These numbers are not printed on the student's sheet. The student sees only two arcs and a transversal.



1–5	$\angle 3$ & $\angle 6$ <i>opposite — fill</i>	$\angle 1$ & $\angle 2$ <i>opposite — fill</i>	$\angle 2$ & $\angle 7$ <i>opposite — fill</i>	$\angle 5$ & $\angle 6$ <i>opposite — fill</i>	$\angle 1$ & $\angle 5$ <i>same side — white</i>
6–10	$\angle 2$ & $\angle 4$ <i>same side — white</i>	$\angle 3$ & $\angle 7$ <i>same side — white</i>	$\angle 6$ & $\angle 8$ <i>same side — white</i>	$\angle 4$ & $\angle 6$ <i>same side — white</i>	$\angle 4$ & $\angle 5$ <i>opposite — fill</i>
11–15	$\angle 1$ & $\angle 3$ <i>same side — white</i>	$\angle 2$ & $\angle 8$ <i>same side — white</i>	$\angle 1$ & $\angle 8$ <i>opposite — fill</i>	$\angle 3$ & $\angle 4$ <i>opposite — fill</i>	$\angle 5$ & $\angle 7$ <i>same side — white</i>
16–20	$\angle 1$ & $\angle 7$ <i>same side — white</i>	$\angle 4$ & $\angle 8$ <i>same side — white</i>	$\angle 2$ & $\angle 6$ <i>same side — white</i>	$\angle 3$ & $\angle 5$ <i>same side — white</i>	$\angle 2$ & $\angle 5$ <i>opposite — fill</i>
21–25	$\angle 6$ & $\angle 7$ <i>opposite — fill</i>	$\angle 1$ & $\angle 6$ <i>opposite — fill</i>	$\angle 7$ & $\angle 8$ <i>opposite — fill</i>	$\angle 3$ & $\angle 8$ <i>opposite — fill</i>	$\angle 1$ & $\angle 5$ <i>same side — white</i>

Angles 1, 3, 5 and 7 are on one side of the transversal and 2, 4, 6 and 8 on the other . One odd and one even means opposite sides. Two odds or two evens means the same side. This rule is a check for you only, because nothing on the student's page is numbered.

10 squares have no arrowheads and it changes none of them. Which side of the transversal an angle is on is a fact about where the angle sits; it is not a claim about the two lines, and it is true whether or not they are parallel. Every one of the five names is built on this comparison and on one more, and neither of the two mentions parallel lines.