

MYSTERY PICTURE

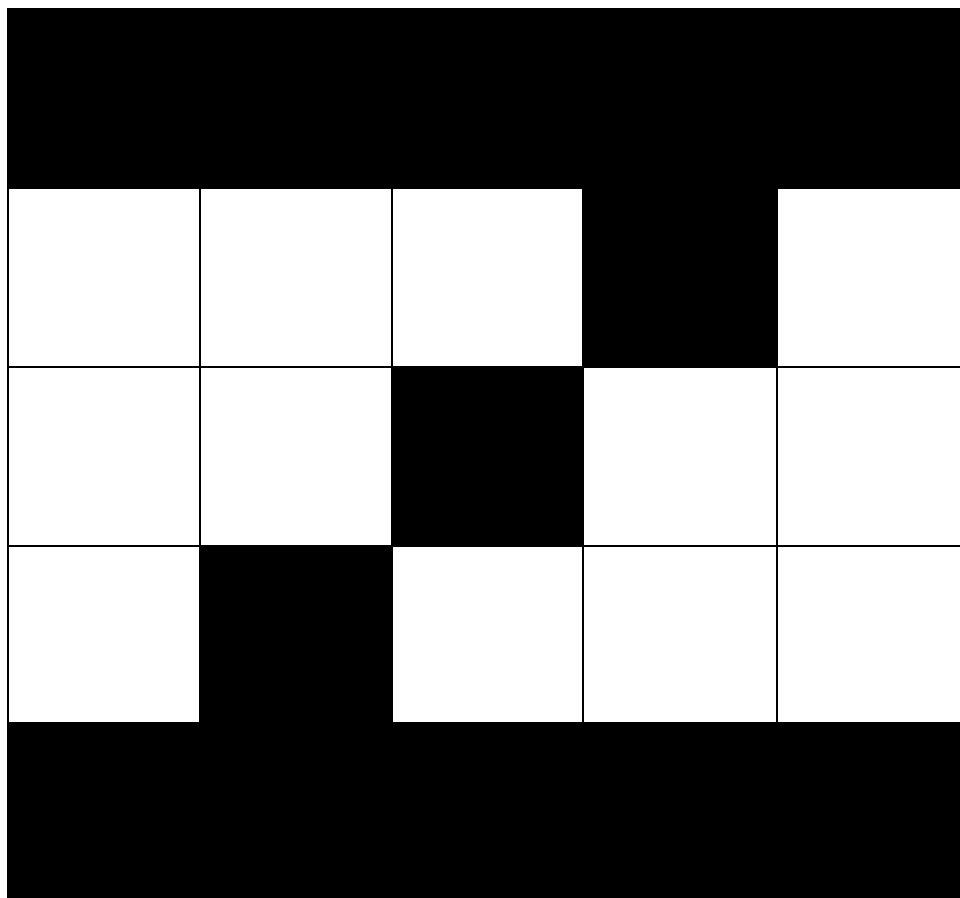


THE SAS TRIANGLE CONGRUENCE CRITERION

Is the Angle Between the Two Sides?

25 squares · the included angle · drawings and letters

FREE



1. **Hand out page 3**, one per student. Pencils. Nothing else is needed.
2. **Say this once:** *“The included angle of two sides is the angle between them. It is at the letter the two side names share. If the marked angle is between the two marked sides, fill the square with slanted lines. If not, leave it white.”*
3. **When a student finishes, look at the picture.** If it is not the letter Z, a square is wrong. The student finds it and checks it again.

Student sheet	page 3, one per student. It shows the included angle as a small picture.
Answers	page 4: the finished picture and the reason for every square.

Thirteen squares are filled and twelve are white. No square asks whether two triangles are congruent. Students only find the angle between two sides. This is the skill the SAS criterion depends on. A student who uses an angle that is not between the two sides will later call two triangles congruent when the marks do not show it.

Twelve squares are drawings and thirteen are words. A drawing has no letters. The student checks whether the arc is at the corner where the two heavy sides meet. A square of words has no drawing. The student finds the letter that is in both side names. That letter is the corner of the angle between the sides.

The white squares show the common mistakes. In two of them the angle is at the first letter written, which many students choose. In three white drawings the arc is at the top corner, which looks like the middle of the triangle, but the heavy sides meet at a lower corner.

Guessing does not work. Every simple guessing rule, such as filling a square when the angle is the first letter written, gets at least seven squares wrong.



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.
chooseyourlesson.com — 135 free geometry lessons.

Mystery Picture

Is the angle between the two sides?

Name _____

Period _____

Date _____

Each square shows two sides and an angle. A drawing marks two sides heavy and the angle with an arc. Is the angle between the two sides? If yes, fill the square with slanted lines. If no, leave it white.



The **included angle** of two sides is **between** them. It is at the letter the two side names share.

When you finish, look at the picture. If part of it is missing, or one square does not fit, check that square again.

1 	2 Sides $\overline{PQ}$ and $\overline{QR}$. Angle: $\angle Q$	3 Sides $\overline{AC}$ and $\overline{BC}$. Angle: $\angle C$	4 	5 Sides $\overline{KM}$ and $\overline{KL}$. Angle: $\angle K$
6 	7 Sides $\overline{PQ}$ and $\overline{QR}$. Angle: $\angle P$	8 	9 Sides $\overline{XZ}$ and $\overline{YZ}$. Angle: $\angle Z$	10
11 Sides $\overline{DE}$ and $\overline{DF}$. Angle: $\angle F$	12 	13 	14 Sides $\overline{KM}$ and $\overline{LM}$. Angle: $\angle L$	15
16 Sides $\overline{BC}$ and $\overline{AC}$. Angle: $\angle B$	17 	18 Sides $\overline{RT}$ and $\overline{RS}$. Angle: $\angle S$	19 	20 Sides $\overline{UV}$ and $\overline{UW}$. Angle: $\angle V$
21 Sides $\overline{HJ}$ and $\overline{GH}$. Angle: $\angle H$	22 	23 Sides $\overline{NP}$ and $\overline{MN}$. Angle: $\angle N$	24 	25 Sides $\overline{EF}$ and $\overline{DF}$. Angle: $\angle F$

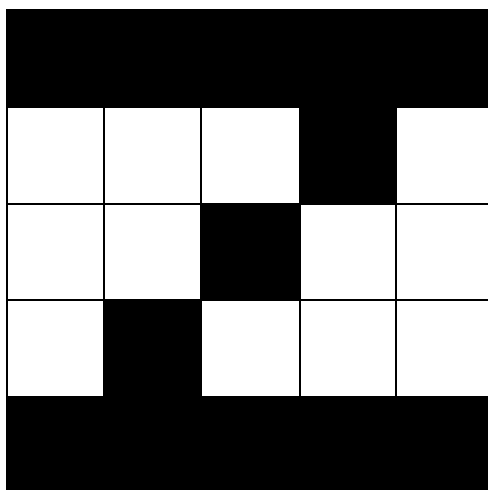


135 free geometry lessons — worksheets, worked answers and lesson plans.
chooseyourlesson.com

Mystery Picture — answers

For the teacher

The finished picture is **the letter Z**: a full bar at the top and at the bottom, joined by a slanted line. A square is filled only when the marked angle is between the two marked sides. The table gives the reason for every square.



1–5	1 · FILL The arc is at the corner where the two heavy sides meet.	2 · FILL Sides $\overline{PQ}$ and $\overline{QR}$ share the letter Q, so the angle between them is $\angle Q$. The square names that angle.	3 · FILL Sides $\overline{AC}$ and $\overline{BC}$ share the letter C, so the angle between them is $\angle C$. The square names that angle.	4 · FILL The arc is at the corner where the two heavy sides meet.	5 · FILL Sides $\overline{KM}$ and $\overline{KL}$ share the letter K, so the angle between them is $\angle K$. The square names that angle.
6–10	6 · white The arc is at a corner where only one heavy side ends. The heavy sides meet at another corner.	7 · white Sides $\overline{PQ}$ and $\overline{QR}$ share the letter Q, so the angle between them is $\angle Q$. $\angle P$ is a different angle.	8 · white The arc is at a corner where only one heavy side ends. The heavy sides meet at another corner.	9 · FILL Sides $\overline{XZ}$ and $\overline{YZ}$ share the letter Z, so the angle between them is $\angle Z$. The square names that angle.	10 · white The arc is at a corner where only one heavy side ends. The heavy sides meet at another corner.
11–15	11 · white Sides $\overline{DE}$ and $\overline{DF}$ share the letter D, so the angle between them is $\angle D$. $\angle F$ is a different angle.	12 · white The arc is at a corner where only one heavy side ends. The heavy sides meet at another corner.	13 · FILL The arc is at the corner where the two heavy sides meet.	14 · white Sides $\overline{KM}$ and $\overline{LM}$ share the letter M, so the angle between them is $\angle M$. $\angle L$ is a different angle.	15 · white The arc is at a corner where only one heavy side ends. The heavy sides meet at another corner.
16–20	16 · white Sides $\overline{BC}$ and $\overline{AC}$ share the letter C, so the angle between them is $\angle C$. $\angle B$ is a different angle.	17 · FILL The arc is at the corner where the two heavy sides meet.	18 · white Sides $\overline{RT}$ and $\overline{RS}$ share the letter R, so the angle between them is $\angle R$. $\angle S$ is a different angle.	19 · white The arc is at a corner where only one heavy side ends. The heavy sides meet at another corner.	20 · white Sides $\overline{UV}$ and $\overline{UW}$ share the letter U, so the angle between them is $\angle U$. $\angle V$ is a different angle.
21–25	21 · FILL Sides $\overline{HJ}$ and $\overline{GH}$ share the letter H, so the angle between them is $\angle H$. The square names that angle.	22 · FILL The arc is at the corner where the two heavy sides meet.	23 · FILL Sides $\overline{NP}$ and $\overline{MN}$ share the letter N, so the angle between them is $\angle N$. The square names that angle.	24 · FILL The arc is at the corner where the two heavy sides meet.	25 · FILL Sides $\overline{EF}$ and $\overline{DF}$ share the letter F, so the angle between them is $\angle F$. The square names that angle.