

MYSTERY PICTURE

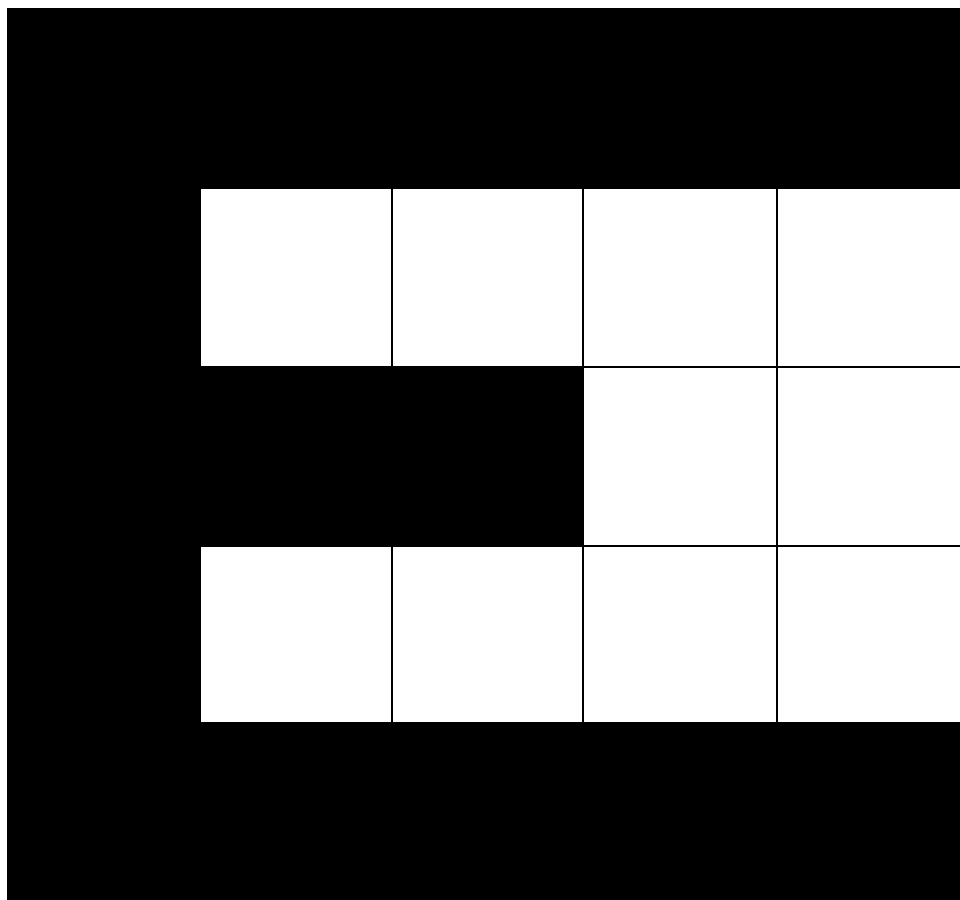


ASA AND AAS TRIANGLE CONGRUENCE

Is the Side Between the Angles?

25 triangles · ASA or AAS

FREE



1. **Hand out page 3**, one per student. Pencils. Nothing else is needed.
2. **Say this once:** *“Find the two corners with angle marks. Then look at the side with the tick. If it joins those two corners, it is ASA: fill the square with slanted lines. If not, it is AAS: leave it white.”*
3. **When a student finishes, look at the picture.** If it is not the letter E, a square is wrong. The student finds it and checks it again.

Student sheet page 3, one per student. It shows SAS, ASA and AAS as three small marked triangles.
Answers page 4: the finished picture and the reason for every square.

This sheet practices one skill: is the marked side between the two marked angles? The side between two angles is the side whose two endpoints are the corners of those angles. Then the rule is ASA. If the marked side has only one of those corners as an endpoint, it is not between them, and the rule is AAS. Students mix these two up more than any other pair of rules, because both have two angles and one side.

Seventeen squares are drawings and eight are sentences. The drawings are turned in every direction, so the marked side is not always at the bottom. In four drawings, one of the two marked angles is a right angle. It is marked with a small square instead of an arc, and it still counts as one of the two angles. In four of the sentences, the order of the words points to the wrong rule. For example, “ $\angle K$, side KL and $\angle M$ ” is written angle, side, angle, but side KL does not join K and M, so it is AAS. The rule depends on where the parts are in the triangle, not on the order they are written in.

Fifteen squares are filled and ten are white. Guessing does not work. Every simple guessing rule, such as filling the square when the tick is on the bottom side, gets at least four 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.
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Mystery Picture

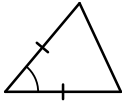
ASA or AAS?

Name _____

Period _____

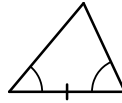
Date _____

Each square shows one triangle, or tells you about one triangle. Two angles are marked and one side is marked. Does the marked side join the two marked angles? If yes, it is **ASA**: fill the square with slanted lines. If no, it is **AAS**: leave it white.

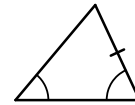


SAS The **angle** is between the two sides.

ASA The **side** is between the two angles.



AAS The side is **not** between the two angles.



Find the two corners with arcs. Then look at the side with the tick. If it joins those two corners, it is **ASA**. If it does not, it is **AAS**. A small square in a corner marks a right angle. It is one of the two marked angles.

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

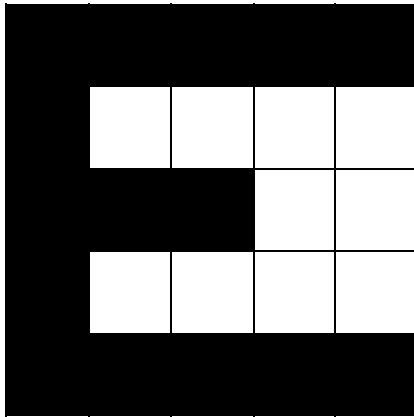
1 	2 	3 In $\triangle ABC$, the marked parts are $\angle A$, $\angle B$ and side AB .	4 	5
6 	7 	8 In $\triangle KLM$, the marked parts are $\angle K$, side KL and $\angle M$.	9 	10
11 	12 In $\triangle DEF$, the marked parts are side EF , $\angle E$ and $\angle F$.	13 	14 	15 In $\triangle PQR$, the marked parts are $\angle Q$, $\angle R$ and side PQ .
16 	17 In $\triangle GHJ$, the marked parts are $\angle H$, side GJ and $\angle J$.	18 	19 In $\triangle XYZ$, the marked parts are side XZ , $\angle X$ and $\angle Y$.	20
21 	22 In $\triangle RST$, the marked parts are $\angle R$, side RT and $\angle T$.	23 	24 In $\triangle UVW$, the marked parts are $\angle W$, side UW and $\angle U$.	25



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Mystery Picture — answers

For the teacher



The finished picture is **the letter E**: a bar down the left side, bars along the top and the bottom, and a shorter bar in the middle.

A square is filled when the marked side joins the corners of the two marked angles (ASA). It is white when the marked side has only one of those corners as an endpoint (AAS).

For a drawing, point to the two marked corners, then to the two ends of the marked side.

1–5	1 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	2 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	3 · FILL In $\triangle ABC$ the angles are at A and B. Side AB joins A and B, so it is ASA. The order of the words does not matter.	4 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	5 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA. The small square is one of the two marked angles.
6–10	6 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	7 · white One end of the marked side is the unmarked corner. The side is not between the two angles: AAS.	8 · white In $\triangle KLM$ the angles are at K and M. Side KL does not join them, so it is AAS. The order of the words does not matter.	9 · white One end of the marked side is the unmarked corner. The side is not between the two angles: AAS.	10 · white One end of the marked side is the unmarked corner. The side is not between the two angles: AAS. The small square is one of the two marked angles.
11–15	11 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	12 · FILL In $\triangle DEF$ the angles are at E and F. Side EF joins E and F, so it is ASA. The order of the words does not matter.	13 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	14 · white One end of the marked side is the unmarked corner. The side is not between the two angles: AAS.	15 · white In $\triangle PQR$ the angles are at Q and R. Side PQ does not join them, so it is AAS.
16–20	16 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	17 · white In $\triangle GHJ$ the angles are at H and J. Side GJ does not join them, so it is AAS. The order of the words does not matter.	18 · white One end of the marked side is the unmarked corner. The side is not between the two angles: AAS.	19 · white In $\triangle XYZ$ the angles are at X and Y. Side XZ does not join them, so it is AAS.	20 · white One end of the marked side is the unmarked corner. The side is not between the two angles: AAS. The small square is one of the two marked angles.
21–25	21 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.	22 · FILL In $\triangle RST$ the angles are at R and T. Side RT joins R and T, so it is ASA.	23 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA. The small square is one of the two marked angles.	24 · FILL In $\triangle UVW$ the angles are at W and U. Side UW joins W and U, so it is ASA.	25 · FILL Both ends of the marked side are marked corners. The side is between the two angles: ASA.