

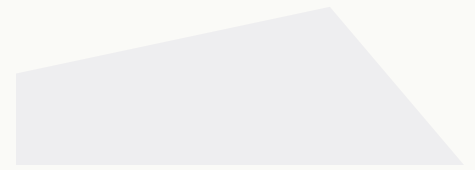


UM PRINTABLES
PREMIUM EDUCATIONAL RESOURCES

SECONDARY MATHEMATICS · GEOMETRY

SCAFFOLDED PROOF BUNDLE

Triangle Congruence Proofs: Task Cards & Scavenger Hunt



A differentiated, scaffolded proof-writing resource for SSS, SAS, ASA, AAS, and HL. Three tiers of 12 cards move learners from fill-in-the-reason reasoning to full two-column proofs — with explicit visual supports for Special Education / IEP students and a self-checking scavenger hunt for on-level learners.

TIER A

Fill-in-the-Reason

Statements given. Students supply reasons from a word bank. Includes proof-outline organizer.

TIER B

Fill-in-the-Statement

Reasons given. Students supply statements by reading the color-coded diagram.

TIER C

Full Proof

Diagram only. Students construct entire two-column proof from scratch.

36

TASK CARDS

8

HUNT CARDS

5

PROOF METHODS

4

SPED MODIFIED

SpEd / IEP Friendly

Color-Coded Parts

Sentence Stems

Proof-Frame Organizer

Self-Checking Loop

UM PRINTABLES
Detailed Solutions

Scaffolded Fill-In · SpEd Supported

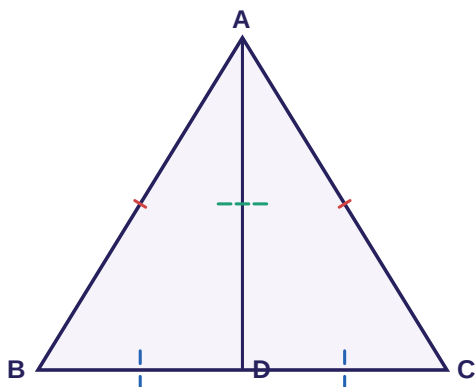
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CARD 3

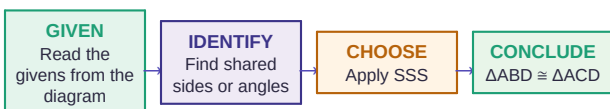
SSS

Given: $AB \cong AC$; $BD \cong CD$ Prove: $\triangle ABD \cong \triangle ACD$

Statement	Reason
$AB \cong AC$	Given
$BD \cong CD$	_____
$AD \cong AD$	_____
$\triangle ABD \cong \triangle ACD$	_____

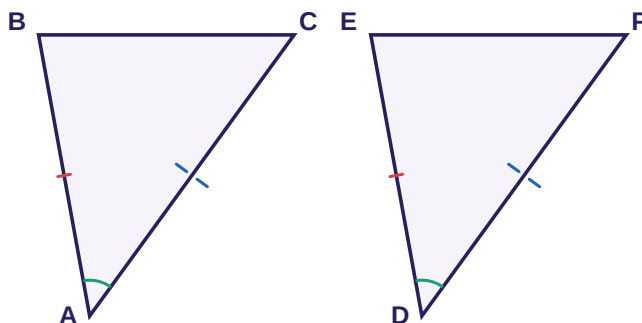
Word Bank: Reflexive Property of Congruence · SSS Congruence Postulate · Given · Definition of Perpendicular · SAS Congruence Postulate · HL Congruence Theorem

PROOF OUTLINE



CARD 4

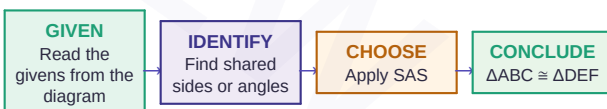
SAS

Given: $AB \cong DE$; $\angle A \cong \angle D$; $AC \cong DF$ Prove: $\triangle ABC \cong \triangle DEF$

Statement	Reason
$AB \cong DE$	Given
$\angle A \cong \angle D$	_____
$AC \cong DF$	_____
$\triangle ABC \cong \triangle DEF$	_____

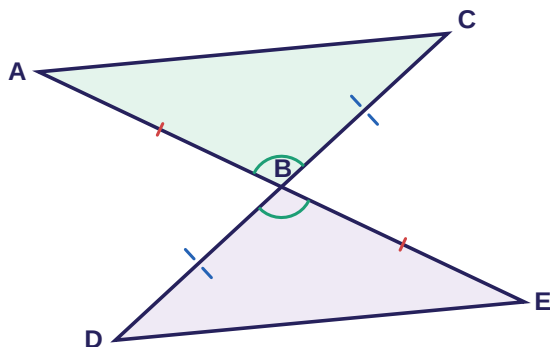
Word Bank: SAS Congruence Postulate · Given · SSS Congruence Postulate · ASA Congruence Postulate · Reflexive Property of Congruence

PROOF OUTLINE



CARD 5

SAS



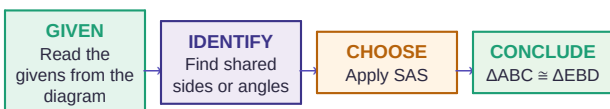
Given: B is the midpoint of AE; B is the midpoint of DC

Prove: $\triangle ABC \cong \triangle EBD$

Statement	Reason
$AB \cong BE$	Definition of midpoint
$DB \cong BC$	_____
$\angle ABC \cong \angle EBD$	_____
$\triangle ABC \cong \triangle EBD$	_____

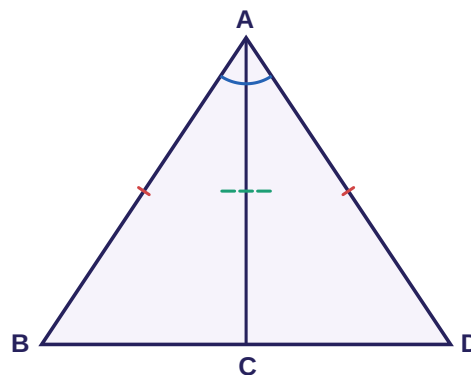
Word Bank: Definition of midpoint · Vertical Angles Theorem · SAS Congruence Postulate · Given · Definition of Angle Bisector · Reflexive Property of Congruence

PROOF OUTLINE



CARD 6

SAS



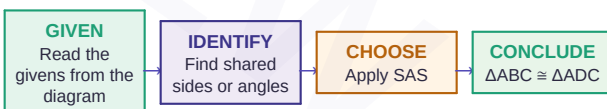
Given: $AB \cong AD$; AC bisects $\angle BAD$

Prove: $\triangle ABC \cong \triangle ADC$

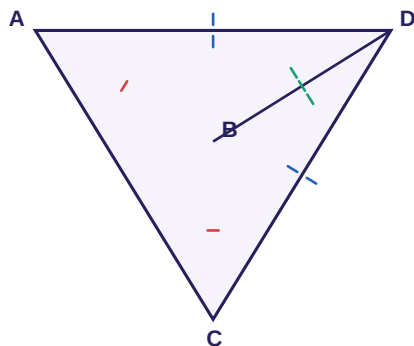
Statement	Reason
$AB \cong AD$	Given
$\angle BAC \cong \angle DAC$	_____
$AC \cong AC$	_____
$\triangle ABC \cong \triangle ADC$	_____

Word Bank: Definition of angle bisector · Reflexive Property of Congruence · SAS Congruence Postulate · Given · Definition of Perpendicular · HL Congruence Theorem

PROOF OUTLINE



SOLUTION · CARD 2 Tier A · SSS



Given: B is the midpoint of AC; $AD \cong CD$

Prove: $\triangle ABD \cong \triangle CBD$

Statement	Reason
$AD \cong CD$	Given
$AB \cong BC$	Definition of midpoint
$BD \cong BD$	Reflexive Property of Congruence
$\triangle ABD \cong \triangle CBD$	SSS Congruence Postulate

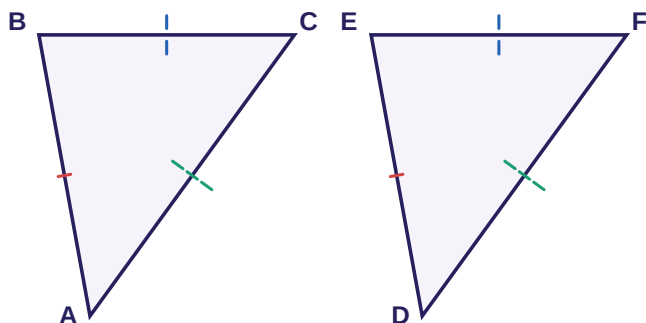
Why this works

B is the midpoint of AC, so by the definition of midpoint $AB \cong BC$. The shared side BD is congruent to itself by the Reflexive Property of Congruence — every segment is congruent to itself. Together with the given $AD \cong CD$, we now have three pairs of congruent corresponding sides, so SSS yields $\triangle ABD \cong \triangle CBD$. Notice that BD is the common leg of the two triangles; identifying shared sides is one of the most common ways the Reflexive Property enters a proof.



CARD 13

SSS



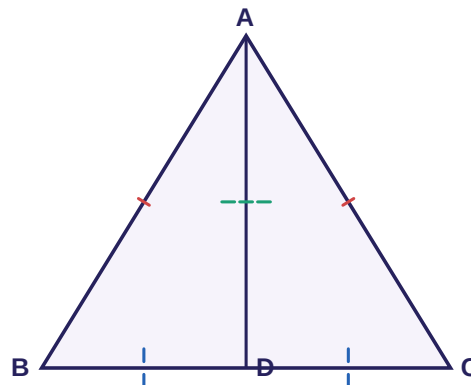
Given: Diagram shows two triangles with all three pairs of corresponding sides marked congruent.

Prove: $\triangle ABC \cong \triangle DEF$

Statement	Reason
$AB \cong DE$	Given
_____	Given
_____	Given
_____	SSS Congruence Postulate

CARD 14

SSS



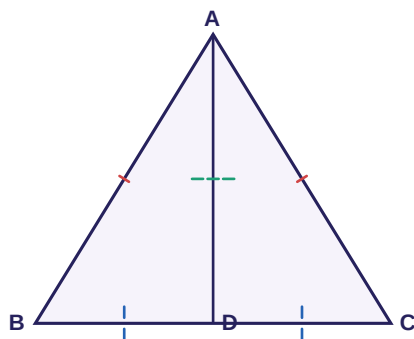
Given: Diagram: $AB \cong AC$, $BD \cong CD$, with AD drawn.

Prove: $\triangle ABD \cong \triangle ACD$

Statement	Reason
$AB \cong AC$	Given
_____	Given
_____	Reflexive Property of Congruence
_____	SSS Congruence Postulate



SOLUTION · CARD 14 Tier B · SSS



Given: Diagram: $AB \cong AC$, $BD \cong CD$, with AD drawn.

Prove: $\triangle ABD \cong \triangle ACD$

Statement	Reason
$AB \cong AC$	Given
$BD \cong CD$	Given
$AD \cong AD$	Reflexive Property of Congruence
$\triangle ABD \cong \triangle ACD$	SSS Congruence Postulate

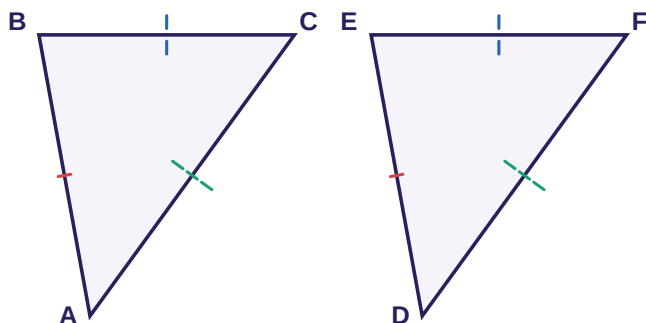
Why this works

From the diagram, $AB \cong AC$ (single tick on each) and $BD \cong CD$ (double tick on each). The segment AD is shared by both triangles, so $AD \cong AD$ by Reflexive Property. Three pairs of corresponding sides give SSS, hence $\triangle ABD \cong \triangle ACD$. Reading 'shared side' from the diagram and then writing the reflexive statement is the key Tier B skill.



CARD 25

SSS



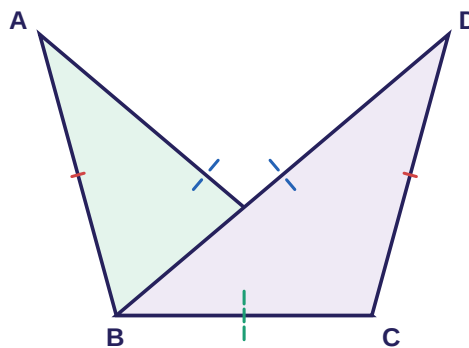
Given: Diagram only — three pairs of corresponding sides marked.

Prove: $\triangle ABC \cong \triangle DEF$

Statement	Reason
_____	_____
_____	_____
_____	_____
_____	_____

CARD 26

SSS



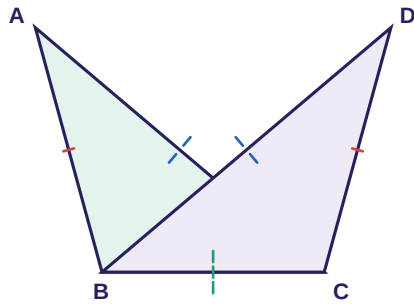
Given: Diagram only — $AB \cong DC$, $AC \cong DB$, BC shared.

Prove: $\triangle ABC \cong \triangle DCB$

Statement	Reason
_____	_____
_____	_____
_____	_____
_____	_____



SOLUTION · CARD 26 Tier C · SSS



Given: Diagram only — $AB \cong DC$, $AC \cong DB$, BC shared.

Prove: $\triangle ABC \cong \triangle DCB$

Statement	Reason
$AB \cong DC$	Given
$AC \cong DB$	Given
$BC \cong CB$	Reflexive Property of Congruence
$\triangle ABC \cong \triangle DCB$	SSS Congruence Postulate

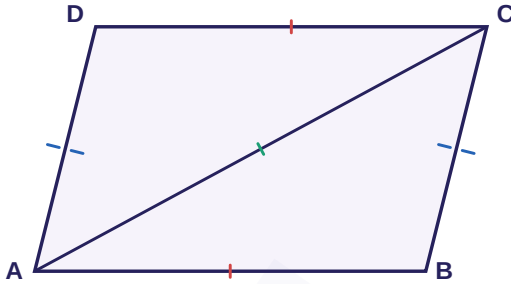
Why this works

Two triangles share side BC . The diagram marks $AB \cong DC$ and $AC \cong DB$. Write $BC \cong CB$ by Reflexive Property — the segment is shared, so it is congruent to itself. SSS gives $\triangle ABC \cong \triangle DCB$. Note vertex correspondence: $A \leftrightarrow D$, $B \leftrightarrow C$, $C \leftrightarrow B$.



PREVIOUS ANSWER
 $\triangle ABC \cong \triangle ADC$ by SAS

SCAVENGER HUNT · CARD C



Given: Diagram only — $AB \parallel DC$, $AD \parallel BC$, with diagonal AC .

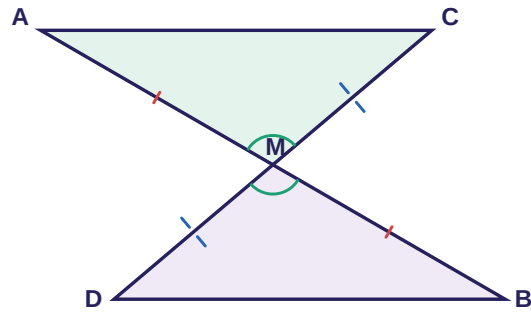
Prove: $\triangle ABC \cong \triangle CDA$

Write your answer:

$\triangle \underline{\hspace{1cm}} \cong \triangle \underline{\hspace{1cm}}$ by $\underline{\hspace{1cm}}$

PREVIOUS ANSWER
 $\triangle ABC \cong \triangle CDA$ by ASA

SCAVENGER HUNT · CARD D



Given: Diagram only — M midpoint of AB and CD .

Prove: $\triangle AMC \cong \triangle BMD$

Write your answer:

$\triangle \underline{\hspace{1cm}} \cong \triangle \underline{\hspace{1cm}}$ by $\underline{\hspace{1cm}}$



Scavenger Hunt Answer Loop

The loop order is shown below. Use this key to verify that students completed the loop correctly, or to help a student who is stuck without revealing the answer outright. The "Previous Answer" on each card matches the answer of the previous card in the loop.

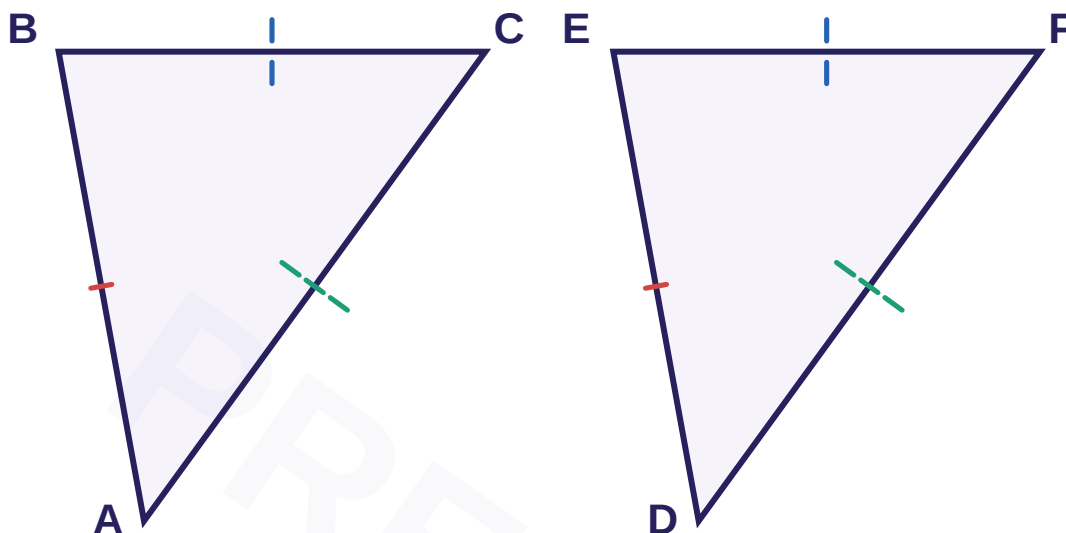
Card	Previous Answer (top of card)	Student writes this answer
A	$\triangle ABC \cong \triangle DEF$ by AAS	$\triangle ABC \cong \triangle DEF$ by SSS
B	$\triangle ABC \cong \triangle DEF$ by SSS	$\triangle ABC \cong \triangle ADC$ by SAS
C	$\triangle ABC \cong \triangle ADC$ by SAS	$\triangle ABC \cong \triangle CDA$ by ASA
D	$\triangle ABC \cong \triangle CDA$ by ASA	$\triangle AMC \cong \triangle BMD$ by SAS
E	$\triangle AMC \cong \triangle BMD$ by SAS	$\triangle ABM \cong \triangle ACM$ by SSS
F	$\triangle ABM \cong \triangle ACM$ by SSS	$\triangle ABD \cong \triangle CBD$ by HL
G	$\triangle ABD \cong \triangle CBD$ by HL	$\triangle PQR \cong \triangle PSR$ by HL
H	$\triangle PQR \cong \triangle PSR$ by HL	$\triangle ABC \cong \triangle DEF$ by AAS

Detailed solutions for each hunt card

Each scavenger hunt card uses a scenario you have already seen in Tier C. The solution below shows the full two-column proof. Use these solutions to spot-check student work or to project during the debrief.



MODIFIED CARD M1 · SSS



Given: $AB \cong DE$ (red); $BC \cong EF$ (blue); $AC \cong DF$ (green)

Prove: $\triangle ABC \cong \triangle DEF$

Statement	Reason
$AB \cong DE$	Given
_____	Given
_____	Given
_____	SSS Congruence Postulate

Sentence stem:

Since _____ congruent to _____ by _____, we can conclude _____.



SpEd Modified Solutions

Each solution shows the complete two-column proof and the filled-in sentence stem. Use these solutions as the teacher key, or share with students after they have attempted the modified card.

SOLUTION · CARD M1 SSS

Statement	Reason
$AB \cong DE$	Given
$BC \cong EF$	Given
$AC \cong DF$	Given
$\triangle ABC \cong \triangle DEF$	SSS Congruence Postulate

Sentence stem (filled in)

Since $AB \cong DE$, $BC \cong EF$, and $AC \cong DF$, we can conclude $\triangle ABC \cong \triangle DEF$ by SSS.

Why this works

Look at the colors. Each color marks a pair of sides that must match. Red matches red ($AB \cong DE$). Blue matches blue ($BC \cong EF$). Green matches green ($AC \cong DF$). When all three pairs of sides match, the triangles are congruent by SSS.

SOLUTION · CARD M2 SAS

Statement	Reason
$AB \cong DE$	Given
$\angle A \cong \angle D$	Given
$AC \cong DF$	Given
$\triangle ABC \cong \triangle DEF$	SAS Congruence Postulate

Sentence stem (filled in)

Since $AB \cong DE$, $\angle A \cong \angle D$, and $AC \cong DF$, we can conclude $\triangle ABC \cong \triangle DEF$ by SAS.

Why this works

Two sides and the angle BETWEEN them are congruent. The angle is included — it touches both pairs of sides. That is exactly the SAS pattern.



Triangle Congruence: A Concept Refresher

Two triangles are **congruent** if and only if their corresponding sides and corresponding angles are congruent — that is, the two triangles are identical in shape and size. They may be flipped, rotated, or translated, but if you could pick one up and lay it on top of the other, every side and every angle would match exactly. In symbols, we write $\triangle ABC \cong \triangle DEF$ to mean "triangle ABC is congruent to triangle DEF." The order of the letters matters: it tells you which vertices correspond — A to D, B to E, C to F.

Proving that two triangles are congruent does not require checking all six pairs of parts (three sides and three angles). The five congruence shortcuts below let us conclude congruence from just three pairs of parts. Each shortcut is the subject of a theorem or postulate, and each is used throughout this bundle.

The five congruence shortcuts

Method	What you need	Type	Memory hook
SSS	Three pairs of corresponding sides	Postulate	<i>Side-Side-Side</i> — every side matches
SAS	Two pairs of sides + the angle <i>between</i> them	Postulate	<i>Side-Angle-Side</i> — sandwich the angle
ASA	Two pairs of angles + the side <i>between</i> them	Postulate	<i>Angle-Side-Angle</i> — sandwich the side
AAS	Two pairs of angles + a non-included side	Theorem	<i>Angle-Angle-Side</i> — side is opposite
HL	Right angle + hypotenuse + one leg	Theorem	<i>Hypotenuse-Leg</i> — right triangles only

Visual reference: SAS vs. SSA (the "ambiguous" case)

A common student error is confusing SAS with SSA. SAS works because the angle is **included** between the two sides — it pins down the triangle. SSA does not work in general, because the angle is **not** between the two sides, and the same two side lengths and angle can produce two different triangles (the "ambiguous case"). The diagram below shows why: with the same two sides and a non-included angle, two non-congruent triangles can be drawn.

Properties you will use over and over

Most proofs in this bundle rely on a small set of supporting properties. Knowing these by name (and by their precise wording) is half the battle of writing two-column proofs.

- **Reflexive Property of Congruence:** Any segment or angle is congruent to itself. Use this whenever two triangles share a side or share an angle.
- **Symmetric Property of Congruence:** If $A \cong B$, then $B \cong A$. Use this to reorder a congruence statement when needed (e.g., writing $AC \cong CA$).
- **Transitive Property of Congruence:** If $A \cong B$ and $B \cong C$, then $A \cong C$. Use this to chain congruences through a shared middle element.



Teacher Notes & How to Use This Resource

Welcome! This resource is a complete, differentiated unit on **triangle congruence proofs** using the SSS, SAS, ASA, AAS, and HL methods. It is designed for a Secondary Geometry class (typically Grade 9–10) and includes explicit scaffolds for Special Education / IEP students while still challenging on-level learners. Every proof in the bundle has been classroom-tested for mathematical correctness, and the three-tier structure means you can meet students where they are without writing three separate curricula.

What is in the bundle?

The bundle contains **36 task cards in three tiers of 12**, an **8-card self-checking scavenger hunt**, a **4-proof modified version for IEP/SpEd students**, a student recording sheet, and detailed solutions for every problem. The three tiers are designed to be used sequentially as a learning progression, but they can also be used in parallel as differentiated stations within a single lesson. Each tier contains three SSS proofs, three SAS proofs, three ASA/AAS proofs, and three HL proofs — so every method is reinforced in every tier.

Three-tier learning progression

Tier	What students do	Best for
A	Statements given; students fill in reasons from a word bank. Includes a proof-outline visual organizer.	Entry point, IEP/SpEd students, students new to two-column proofs
B	Reasons given; students fill in statements by reading the color-coded diagram.	Students who can identify theorems but struggle to translate diagram marks into statements
C	Diagram only; students construct the entire proof from scratch.	On-level and above-level students; end-of-unit assessment

How to use the cards

Option 1 — Sequential progression (3–4 days). Use Tier A on Day 1 to introduce the structure of two-column proofs. Move to Tier B on Day 2 to develop diagram-reading fluency. Finish with Tier C on Day 3 as independent practice. Use the scavenger hunt on Day 4 as a review activity that gets students moving.

Option 2 — Differentiated stations (1 day). Print Tier A, B, and C cards in three different stations. Assign students to the station that matches their readiness level. Have each student complete 4–6 cards in the period. Rotate every 15 minutes.

Option 3 — Homework + scavenger hunt. Assign 6 Tier C cards as homework over two nights. Use the scavenger hunt in class on the third day as a self-checking review.

Option 4 — IEP/SpEd pull-out. Use the modified 4-proof version with enlarged diagrams, color-coded parts, and printed sentence stems. The modified version covers one proof per method family, so students still see all five methods in a single sitting.



Special Education Supports & Differentiation Guide

This resource was built from the ground up with Special Education and IEP students in mind. The scaffolds are not "extras" bolted onto a standard worksheet — they are integral to the design of every card and every tier. Research on scaffolding in mathematics (Brousseau, 1997; Hiebert et al., 1997; NCTM Principles to Actions, 2014) emphasizes that scaffolds must be **structured, removable, and visual**. The supports below follow that research.

Five evidence-based supports built into every tier

Enlarged, color-coded diagrams

Each diagram uses three or four colors (red, blue, green, purple) to mark corresponding parts. The tick-mark convention is consistent across the entire bundle: a single tick on a side always pairs with a single tick on the corresponding side; a single arc on an angle always pairs with a single arc on the corresponding angle. Students who struggle with diagram-reading can rely on the color match as a redundant cue, while students who are colorblind can rely on the tick-mark count alone.

Proof-frame graphic organizer (Tier A, cards 1–12)

Every Tier A card includes a four-step visual organizer showing the logical flow: **Given** → **Identify** → **Choose** → **Conclude**. This frame is a metacognitive scaffold — it makes the proof-writing process visible. Students who internalize the frame eventually stop needing it, at which point they are ready for Tier B.

Sentence stems for reasoning

The SpEd modified version prints a sentence stem at the bottom of each card: "Since ____ congruent to ____ by ____, we can conclude ____." This stem reduces the cognitive load of producing mathematical English from scratch. It also gives language-learners and students with working-memory weaknesses a syntactic frame to fill in. The stem is intentionally general so that it works for all five proof methods.

Reduced-item modified version (4 proofs)

The SpEd modified version contains only 4 proofs — one per method family. Each modified card has an enlarged diagram (1.5× scale), color-coded parts, and the sentence stem printed on the card itself. This reduced cognitive load matches the IEP goal of "demonstrate mastery of triangle congruence at a reduced item count." The four proofs cover SSS, SAS, ASA, and HL — so the student still experiences every required method.

Word bank on every Tier A card

Tier A cards print a word bank directly on the card. This eliminates the need for students to retrieve vocabulary from long-term memory while they are still learning the structure of two-column proofs. The word bank includes the correct reason plus three distractors, so students must still **evaluate** which reason fits — they cannot simply write the only option.

Differentiation matrix

Student profile	Recommended starting tier	Suggested progression
IEP / modified curriculum	SpEd Modified Version	Modified → Tier A (cards 1–6) → Tier A (cards 7–12)



Student Recording Sheet

Print one recording sheet per student. Students write the card number, the method they used, and the final congruence statement for each card they complete. The sheet fits all 36 task cards or all 8 scavenger hunt cards on a single page (front/back).

Tier A — Cards 1–12

#	Card #	Method	Congruence Statement	☐
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			

Tier B — Cards 13–24

#	Card #	Method	Congruence Statement	☐
	13			



THANK YOU FOR USING THIS RESOURCE!

Your feedback directly shapes future UM Printables releases. If this resource saved you planning time, engaged your students, or helped an IEP student access grade-level content, please take a moment to leave a review on Teachers Pay Teachers.

Log in to your TPT account.

Go to "My Purchases" → locate this resource.

Click "Provide Feedback" — it takes less than 60 seconds.

Each review earns you TPT credits toward future purchases.

What to mention in your review

Mention which tier your students used (A, B, C, or Modified), how long the unit took, and any specific student win — "My IEP student completed her first full proof independently with the modified version" — these stories help other teachers decide if this resource fits their classroom.

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PREVIEW - WHAT IS INSIDE THE FULL RESOURCE

Triangle Congruence Proofs: Task Cards & Scavenger Hunt

A differentiated, scaffolded proof-writing resource for secondary geometry covering SSS, SAS, ASA, AAS, and HL.

89

TOTAL PAGES

36

TASK CARDS

3

SCAFFOLDED TIERS

5

PROOF METHODS

WHAT THE FULL RESOURCE INCLUDES

A

Tier A - Fill-in-the-Reason (12 cards)

Statements are given; students supply reasons from a word bank. Includes the proof-outline organizer.

H

Self-Checking Scavenger Hunt (8 cards)

Eight cards form a self-checking loop using a previous-answer / next-card structure.

B

Tier B - Fill-in-the-Statement (12 cards)

Reasons are given; students supply statements by reading the color-coded diagrams.

S

Detailed Solutions

Complete two-column proofs with plain-language "why this works" explanations.

C

Tier C - Full Proofs (12 cards)

Diagram only; students construct the complete two-column proof from scratch.

T

Teacher Notes & Differentiation Guide

Resource overview, pacing, four suggested use options, printing tips, and a differentiation matrix.

M

SpEd Modified Version (4 proofs)

Reduced item set covering SSS, SAS, ASA, and HL, with enlarged diagrams and sentence stems.

R

Student Recording Sheet

Recording space for all 36 task cards and all 8 scavenger hunt cards across three printable pages.

CORE PROOF METHODS

SSS

SAS

ASA

AAS

HL

Teacher-facing support, concept refresher, proof-writing toolkit, task cards, solutions, scavenger hunt, modified proofs, and recording sheets are all included in the full file.