Lesson 3.5c — Teacher Reference Notes

Scaffolded Proof Practice

Unit 3: Proof and Congruence • Day 7 of 9

At a Glance

Pacing: Warm-up: errors from 3.5b (~12 min) • Thin-sliced problems (~60 min) • Consolidation + nav instrument update (~18 min)

Materials: Student problem set (downloads) • Individual proofs from 3.5b to return • Navigation instruments • Boards and markers

Nav instrument rows active: All rows • Rows 5–6 (Proof Structure and Writing Complete Proofs) are the focus

Before class: Review individual proofs from 3.5b. Identify 2–3 most common errors. Plan the warm-up. Do not grade the proofs — return as feedback only.

Group vs. individual: If 3.5b proofs showed many students still struggling with basic structure: run mild as groups, medium/spicy as individual. If most showed solid structure: run everything individually with groups as a resource.

OBJECTIVES

By the end of this lesson students can:

- Choose an appropriate entry point for proof writing based on honest self-assessment.
- Write a complete proof at their current level and attempt the next level up.
- Recognize that a spicy conclusion requires proving a milder intermediate claim first — and identify what that claim is.
- Update their navigation instrument accurately to reflect proof-writing ability.

WARM-UP — ADDRESSING COMMON ERRORS FROM 3.5B (≈12 MIN)

Return individual proofs from 3.5b without grades — as feedback only. Before handing them back, address the 2–3 most common errors on the board without identifying which students made them.

Common errors from Year 1 — address as class questions, not corrections

1. Naming a shortcut without specifying which parts are congruent and how each is established. Ask: ‘If someone writes “by ASA” without naming the specific parts, what is missing? What would a reader need to verify the claim?’

2. Using alternate interior angles without citing a given of parallel lines. Ask: ‘What must be true for alternate interior angles to be congruent? Where does that come from in the given?’

3. Incorrect congruence statement notation — corresponding vertices not in matching order. Ask: ‘What does the order of letters in a congruence statement tell the reader?’

4. Applying a triangle shortcut to an angle relationship (or vice versa). Ask: ‘Is this a statement about triangles or about angles? Which tools apply to each?’

THE THIN-SLICED STRUCTURE — HOW IT WORKS

Explain this to students before they begin

Each problem has the same given information and diagram but three levels of conclusion to prove: Mild, Medium, and Spicy.

Mild: Prove the triangles are congruent. This is often the intermediate step for higher levels.

Medium: Prove something that requires the mild result as a step along the way. The mild proof is now an intermediate step you need but are not told about.

Spicy: Prove a conclusion that may require both mild and medium results. You may need to prove two or three things to get there.

The mild proof is always embedded inside the medium proof, which is embedded inside the spicy proof. A student who completes spicy has written three connected proofs, not one hard one.

⚠ **Circulating during the problems**

Students stuck at Mild: 'What do you know from the given? What does the diagram give you for free?'

Students stuck at Medium or Spicy: 'What would you need to know before you could prove that? Have you proven it yet? Is that what the Mild level was asking?'

Students who reach Spicy quickly: Ask them to write the complete argument as a single connected paragraph proof flowing from given to spicy conclusion. This is the most sophisticated form.

CONSOLIDATION (≈15 MIN)

With 10 minutes remaining, bring the class together. Choose one question:

Consolidation prompts — choose one

"Who moved from Mild to Medium on any problem? What did you have to do differently?"

"Who attempted Spicy? What made it harder than Medium — and what made it achievable once you had the Medium result?"

What to draw out

The goal: students articulate the embedded structure. If a student can say 'I needed to prove the triangles congruent first, even though that wasn't what was being asked' — they have internalized the most important lesson of this unit.

Name it explicitly: 'Every spicy conclusion in this set required you to prove something milder first, even if we didn't tell you to. This is what complex proof writing always looks like. The intermediate steps are always there — the skill is learning to see them.'

Navigation instrument update — do this before students leave

Ask students to update their navigation instrument based on today's work. This is the last full proof practice lesson before 3.6 review and 3.7 assessment. Students should leave knowing clearly where they stand on Rows 5 and 6.

Connection Points

- Draws from Lessons 3.5a–3.5b: all three proof planning strategies are in active use; the embedded structure of complex proofs is named explicitly here for the first time
- Problem 4 spicy and Problem 6 medium draw on Common Notions 2 and 3 — same tools used in Proposition proofs in Lesson 3.1
- Feeds into Lesson 3.6: navigation instrument data from today drives how the review day is structured
- Feeds into Lesson 3.7: assessment problems will require seeing and using embedded intermediate steps