

CORE

Lab 12: The Symbology Specification

Design symbols that encode category, quantity, hierarchy, and uncertainty without default drift

Chapter Chapter 12	Level Intermediate	Time ~2.5-3 hr
Mode Individual or pair	Technology Any course-approved LLM	Deliverable Map scenario and layer brief

Why This Lab Matters

Chapter 12 treats symbols as visual arguments about presence, category, magnitude, hierarchy, and uncertainty. This lab teaches you to specify symbol intent before form, then critique whether shape, size, opacity, and texture are doing honest work.

Essential question

What cartographic decision should you be able to defend by the end of this lab?

Learning Objectives

- State the cartographic purpose, audience, evidence, and constraints.
- Use an LLM or assistant as a collaborator while preserving human judgment.
- Revise the artifact or prompt based on explicit critique.

At a glance

Inputs: Lab scenario, prompts, data notes, or map concept supplied in the activity.

Outputs: Map scenario and layer brief; Symbol Intent Brief; Shape rules and rejected alternatives.

Evaluation: Clear purpose, defensible cartographic judgment, concise prompting, and evidence of human verification where needed.

Setup: Choose a Symbol-Rich Map ~15 min

Choose one scenario with at least two symbol layers and at least one point layer.

- Earthquake events by magnitude and confidence
- Public transit stops, stations, routes, and service alerts
- Emergency shelters, hazards, road closures, and supply sites
- Community assets, risk facilities, and neighborhood boundaries
- Wildlife sightings, habitat zones, and uncertainty buffers

Map scenario
Topic:
Place:
Audience:
Layer 1 geometry and purpose:
Layer 2 geometry and purpose:
Layer 3 geometry and purpose:
Primary user task:
What the symbols must communicate:
What the symbols must not imply:

PROCEDURE

Part 1 - Write Symbol Intent Before Form ~25 min

Create a Symbol Intent Brief for this map. For each layer, state what the symbol must communicate: presence, category, quantity, uncertainty, selection state, movement, risk, or context. Then identify the primary visual variable for each layer: shape, size, opacity, texture, color, line weight, or outline. Use only one primary encoding per layer unless you justify a secondary cue.

Map scenario:
[PASTE]

Layer	Geometry	Symbol intent	Primary encoding	Secondary cue	Risk
Example: Short note	Example: Short note	Example: Short note	Example: Short note	Example: Short note	Example: Could overstate certainty
Example: Short note	Example: Short note	Example: Short note	Example: Short note	Example: Short note	Example: Could overstate certainty
Example: Short note	Example: Short note	Example: Short note	Example: Short note	Example: Short note	Example: Could overstate certainty

Starter examples only; expand this in your own notes or submission document.

PROCEDURE

Part 2 - Design Shape for Categories ~25 min

Design shape rules for categorical symbol differences in this map. Prioritize perceptual distinctness and broad recognizability. Avoid culturally specific, era-dependent, cute, or emotionally loaded pictographs unless explicitly justified. Recommend geometric or simplified icon forms and explain rejected alternatives.

Mini-deliverable

List at least three symbol alternatives you reject and explain what unintended rhetoric each one could introduce.

PROCEDURE

Part 3 - Verify Size Logic for Quantities ~30 min

If any symbol varies by quantity, create a proportional sizing plan. State whether values are raw counts, rates, ranks, or classes. Require scaling by area, not radius. Include minimum and maximum sizes, outlier handling, legend labels, and a verification check showing how small, medium, and large values will be represented without exaggeration.

Trust but verify

If size represents quantity, the map is making a mathematical promise. Ask the LLM to show the scaling logic, not just the visual result.

PROCEDURE

Part 4 - Use Opacity and Texture Responsibly ~25 min

Create opacity and texture rules for hierarchy, overlap, and uncertainty. Specify when transparency should preserve basemap context, when hover or selection should increase emphasis, when opacity may represent uncertainty, and how the legend should explain that meaning. Add texture only as a redundancy or emphasis cue, not as decoration.

PROCEDURE

Part 5 - Decide Library, PNG, or SVG ~30 min

Decide whether this map should use standard library symbols, custom PNG symbols, custom SVG symbols, or a combination. For each custom symbol, write constraints for scale legibility, stroke weight, fill, transparency, detail level, and semantic meaning. Explain why a library symbol may be safer or why a custom symbol is justified.

If you choose SVG for any symbol, draft a focused SVG prompt.

Generate a minimalist SVG symbol specification for [FEATURE]. Requirements: under 1 KB, readable at 16 px, simple stroke or fill, no unnecessary interior detail, consistent with the map's visual schema, transparent background, and one-line intended meaning. Return the SVG concept description and quality checklist.

PROCEDURE

Part 6 - Build the Symbology Specification ~30 min

Compile my decisions into a production-ready Symbology Specification. Include:

1. map argument and user task
2. layer-by-layer symbol intent
3. shape rules for categories
4. size rules for quantities, including area scaling
5. opacity rules for hierarchy and uncertainty
6. texture rules for redundancy
7. symbol source: library, PNG, or SVG
8. overlap, clustering, and decluttering plan
9. legend labels and explanatory notes
10. failure modes prevented
11. a self-check asking the assistant to justify each symbol against intent

Write this as a professional specification.

PROCEDURE

Part 7 - Run a Failure-Mode Critique ~25 min

Critique this Symbology Specification. Look for overly literal icons, decorative color creep, style drift across layers, proportional sizing errors, unclear uncertainty, weak legend language, and overlap problems. Recommend minimal revisions and explain which risks remain.

Submission ~20 min

- Map scenario and layer brief
- Symbol Intent Brief
- Shape rules and rejected alternatives
- Size scaling plan and verification
- Opacity and texture rules
- Library/PNG/SVG decision
- Final Symbology Specification
- Failure-mode critique
- 400-600 word reflection on symbols as visual arguments