Lesson Plan: Logic Tournament

Year Group: 8 | **Duration:** 50 minutes | **Topic:** Boolean Logic Applied to Search

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1. Overview

Core Concept: Boolean logic applied to elimination search — using yes/no conditions to narrow a set, and evaluating which conditions are most efficient.

Learning Objectives:

- Apply AND logic to narrow a set using multiple conditions simultaneously
- Evaluate the efficiency of different yes/no questions
- Connect elimination search to binary search and database queries

Key Vocabulary:

Term	Definition
Elimination	Removing items that don't match a condition
Condition	A yes/no question about an attribute
Boolean query	A question that returns TRUE or FALSE for each item
Efficient	Achieves the goal with minimum steps
Binary search	Repeatedly halving the search space to find an item

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2. Before the Lesson

Print:

- ☐ `resource-character-sheet.md` — 2 per student (one reference, one to mark off)
- ☐ `worksheet-strategy-analysis.md` — 1 per student

Room Setup: Pairs facing each other.

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3. Timed Lesson Flow

0–5 min — Rules

1. Each student secretly picks a character from the grid.
2. Players take turns asking yes/no questions about ATTRIBUTES (not names).
3. Cross off eliminated characters after each answer.
4. First to correctly identify partner's character wins.
5. Track: how many questions did you need?

5–25 min — Round 1: Play!

25–32 min — Strategy Discussion

- What was your first question? Why?
- What's the ideal question? → one that eliminates exactly 12 characters regardless of the answer (50/50 split)

32–42 min — Worksheet: Efficiency Analysis

Calculate how many characters each question type eliminates.

42–48 min — Round 2 with strategy

48–50 min — Debrief: this IS binary search. Every optimal question halves the candidates. Databases use this logic.

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4. Teacher Facilitation Notes

What to look for:

- Students asking "Is your character Alex?" — eliminates only 1 if NO. Very inefficient.
- Students not eliminating eliminated characters — keeping track is the whole game

Common misconceptions:

- The best question is the one most likely to be YES — no, the best question splits 50/50
- More attributes in one question = more efficient — a compound AND question may be too specific

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5. Extension Tasks

1. Write a 3-attribute AND query. How many characters match?
2. Compare to SQL: `SELECT * FROM characters WHERE hair='blonde' AND glasses=TRUE`
3. Design a character sheet where it's harder to find the efficient questions

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6. Key Takeaway

> **Efficient Boolean queries eliminate the most possibilities with the fewest conditions. This is how search engines and databases work — indexed yes/no filtering on attributes.**