# Mystery Machine

One student runs a secret rule on a set of objects, answering only yes or no. The class has to reverse-engineer the rule by testing examples — the same move used to audit a real black-box system.

| AGE BAND | DURATION | GROUP SIZE | CONCEPT |
|---|---|---|---|
| Ages 7–11 | 15–20 minutes | Whole class | Algorithms |

Learning objective

Students can **describe how testing examples and watching outputs lets you build confidence in a rule you cannot see directly.**

## What you need

- 12–16 small objects or cards, each with 2–3 visible features (color, shape, size)
- One sealed 'rule card,' written by the teacher in advance
- A board or chart to record yes/no answers

## Why this works

Most of what a rule-based system does happens somewhere nobody in the room can watch. The realistic response isn't to give up on understanding it — it's to test it carefully and build a model of its behavior from the outside. That's an inductive-reasoning skill, and it's exactly what this game rehearses, with nothing higher-tech than yes and no.

## How it works

1. Ahead of time, the teacher privately writes a simple sorting rule — for example, "anything with more than four sides" — and seals it.
2. One student, the Machine, applies the rule silently to any object the class hands over, answering only "yes" or "no."
3. The class takes turns offering objects and recording each answer where everyone can see it.
4. After 8–10 tests, groups guess the rule and check their guess against two new objects before the reveal.
5. Reveal the real rule. Talk about which guesses were close, and which test would have settled it faster.

## Talk about it

- What was the fewest tests you needed before you felt confident in your guess?
- Was there a test you wish you'd tried earlier — one that would have ruled out more guesses at once?
- If the Machine refused to explain any of its yes-or-no answers, how would that change how much you trusted it?