

## Notation and the Foundational Objects

Unit 1: Foundations of Geometry • Day 2 of 2

### At a Glance

**Pacing:** Finish any remaining Day 1 vocabulary (brief) • ~35 min card task  
• ~10 min notation consolidation • ~25 min navigation instrument  
introduction + CYU begins

**Materials:** Card task sets (print and cut — one set per pair) • Navigation  
instrument (distribute during final portion)

**Nav instrument rows active:** Rows 1 and 2 fully active today. First use of  
the navigation instrument at end of class.

**Critical note:** The notation gap on the unit test was significant. Treat the  
card task as a genuine consolidation priority, not a warm-up activity.

### OBJECTIVES

By the end of this lesson students:

- Can name every foundational object using correct symbolic notation.
- Can distinguish between notation for a line, ray, and segment given the same two points.
- Can explain why two points are not sufficient to define a plane.
- Can use the navigation instrument to honestly self-assess their current standing on Rows 1 and 2.

### OPENING — FINISH REMAINING VOCABULARY

Keep this brief if most definitions were completed in Day 1. Save the symbols and the practice problem for after the card sort. Complete any remaining terms from: collinear, coplanar, parallel, perpendicular. Then move directly to the card task.

#### The two-point plane question — worth a minute

*Two points define a line. A line can lie in infinitely many planes — tilted at any angle through that line. A third non-collinear point pins the plane to a specific orientation. This is the Advanced descriptor on Row 2 of the navigation instrument. Students who understand it are demonstrating something genuinely conceptual.*

### TASK

#### The Card Task (from Math Medic, mathmedic.com) (≈35 min)

##### Setup

*Students work in pairs with a divider between them. One student has picture cards arranged in a 3×3 grid. The other has notation cards. The notation student asks questions*

*about the pictures and attempts to recreate the grid using only the answers they receive. When ready, both reveal and compare.*

**⚠ What to listen for — this is where notation is learned**

*Students will notice they have multiple cards with the same two letters (AB, AB with a line, AB with arrows, AB with one arrow). They cannot identify the right picture without knowing which symbol is which. This is the moment notation becomes necessary rather than decorative.*

*Model question to name during circulating: 'I have three cards with AB on them, but one has a line on top, one has arrows on both sides, and one has an arrow on only one side. Does that match what you're seeing?'*

After pairs complete and compare: bring the class together. Consolidate notation as a class. Students leave with a complete, correct notation record for all foundational objects.

**Also important:** encourage students to use notation when working at the boards, not only in notes. If a student avoids symbols, ask them to write the full sentence instead. The experience of writing 'the line that passes through point A and point B and extends in both directions without end' will quickly demonstrate the value of the shorthand.

## INTRODUCING THE NAVIGATION INSTRUMENT (≈25 MIN)

Distribute the navigation instrument. Do not send it home to be completed alone. The first use should be in class, with you nearby.

### How to run the first navigation instrument session

**Step 1:** Walk through Rows 1 and 2 together. Ask: what does 'basic' mean here? What does 'advanced' mean?

**Step 2:** The key question to answer together: how do you know which level you're at? The answer is — you check by trying a problem, not by feeling like you understand. That is one of the most important lessons of the year.

**Step 3:** Have students work the corresponding CYU problems in class and mark the instrument as they go. This models the practice that should continue all year: the instrument is a living document, updated in real time, not a form to fill in at the end.

### ✍ Students make notes on:

- Completed notation reference for all foundational objects — every object with its symbol and a small diagram
- The plane question: why three non-collinear points, not two
- Navigation instrument Rows 1 and 2 marked honestly after working CYU problems

**Connection  
Points**

- Feeds into every unit: notation learned here is used in proofs from Unit 3 onward
- Navigation instrument: the habit of honest self-assessment built here carries all year