

INVESTIGATIONS

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QUESTIONABLE NUMBER LINES

Using estimation, properties of number and a sprinkling of creativity, *Questionable Number Lines* is a fun investigative routine you can keep coming back to.

HOW IT WORKS



‘What could the unknown numbers be?’

This one short question invites learners to make inferences about unknown numbers, and opens up fascinating – and often surprising – insights.

After posing the question, **give students time to think on their own**, so that they can make sense of their own ideas. Then, **open up discussion** – ask students for answers, but importantly also for the reasons behind these. This will enable students to learn from one another – and also give you valuable evidence of what students understand.

GO DEEPER

By keeping this routine short, but returning to it regularly, students will become familiar with how it works. They’ll also go deeper over time, forming new insights and becoming more sophisticated in their thinking and reasoning. Here are examples you might use as a follow-up:

- Swap the 30 with decimals, percentages or fractions, e.g. , 0.6, 60% or $\frac{3}{5}$
- Swap the 30 with negative integers, e.g. -3
- Move the 30 to a different part of the number line, e.g., a bit to the left

Help students form new mathematical connections, ask:

- How are these solutions similar? Different?
- Could this strategy always work? Why/why not?
- Talk about the solution [insert student name] found with a partner. Why does it work?
- Take a strategy you’ve heard someone else describe. Can you use it for this next example?

WHY USE IT?

With plenty of correct answers, *Questionable Number Lines* gives learners valuable practice in:

- Estimation and benchmarking thinking
- Locating, ordering and comparing the size of numbers
- Looking at numbers as lengths
- Examining the relationship between different kinds of numbers, e.g. positive whole numbers, fractions, decimals, negative integers
- Explaining and justifying their observations.

You can use this investigative routine as a short opener, brain break or even as a diagnostic or formative assessment tool.

TIPS FOR THE CLASSROOM

- Start simple to build familiarity with how this routine works
- Stay neutral to create a safe space for sharing
- Keep taking responses to encourage risk taking
- Invite student analysis to help them make sense of what’s been shared
- Encourage students to draw their own number lines. This will help them to better understand the size and order of numbers they are working with.

CURRICULUM LINKS

Within the new Victorian Curriculum there are many explicit references to representing, locating, comparing and ordering numbers on a number line. Including: VC2M1N01 (Level 1), VC2M2N01 (Level 2), VC2M4N04 (Level 4), VC2M5N01 and VC2M5N03 (Level 5), VC2M6N01 and VC2M6N03 (Level 6), and VC2M7N03 (Level 7).

What kinds of investigations have you used in your classroom as a launch for mathematical exploration?

Our readers would love to hear your experiences. You can share your ideas with us at primenumber@mav.vic.edu.au.