

Facilitation Guide

This guide provides an overview of common scenarios and questions that may arise during the implementation of the nudge, along with strategies to support its success.

MLR Nudge 4 Wrong Two Ways

Recap

This nudge strengthens number sense by having students estimate solutions that are too large, too small, and just right. It encourages students to think critically and justify their reasoning.



Situation: Students are just solving the problem instead of estimating first.

This is a great time to work on estimation skills, which secondary students might not be used to.

- Encourage small group discussions and brainstorming sessions (without the use of writing utensils if needed) to help students think about strategies they can use to develop these wrong answers and estimates.
- Emphasize the importance of the thought process over the final answer and provide examples of how estimation is used in real-life scenarios to make it more relatable.



What follow-up questions can I ask as students are sharing their responses?

Consider these follow-up questions:

“Why do you think that is too large (or too small)?”

“Based on these estimates, what’s a reasonable range of solutions?”

“How does your wrong answer compare to the others that have been shared?”

How does your wrong answer compare to the others that have been shared?

“How did you come up with that estimate?”



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How can I use this nudge to informally gauge student understanding?

Pay attention to the variety of estimates students provide. A wide range of responses can indicate that students are thinking critically and exploring different possibilities.

Then, focus on how students justify their estimates. Strong justifications with clear reasoning show a deeper understanding of the concepts involved.

Finally, you can consider consistency across different implementations of this nudge. Are students consistently applying estimation or wrong answer generation strategies?



How can I broaden this task?

You can choose any task and have students come up with two incorrect answers, each wrong for different reasons. This opens it up beyond just numerical tasks.

Situation: Students are giving answers that are “just a little bit large” or “just a little bit small”.

The idea of considering “too large” or “too small” solutions may be new to students! The first couple times you do this, you may need to scaffold for students how to think about numbers that are too large or too small. You may need to encourage students to think about extreme cases to stretch their understanding of what “too large” and “too small” really mean.

Some possible sentence stems include:

“In another class, someone said [insert estimate], what do you think about that estimate?”

“Turn and talk about an answer that would be way too large for this.”



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Situation: When asked for incorrect answers that are either too large or too small, a student provided the correct answer.

In this situation, the student may have suggested the correct answer, thinking that it is “too big” or “too small.” It can be helpful to ask the student to explain their thought process. This provides an opportunity for other students to suggest ways to adjust the guess. It can also help you understand where the misunderstanding occurred, allowing you to gently guide the student to think about why their answer might not be too large or too small.

The student might also have figured out what the right answer is and given that as an estimate, not being used to providing wrong answers. In this case, you may discuss how this answer is reasonable, and ask other students to provide ones that are too big or too small.



Situation: Students are throwing out a wide variety of solutions that are too large or too small.

This is what the nudge is designed to do. Make sure you’re considering how you’re responding to each response and make sure that students have time to think on their own before sharing a potential wrong answer or estimate.

You might consider discussing why some estimates are more reasonable than others. Encourage students to explain their reasoning and listen to their peers’ explanations to refine their understanding.

This can also be an opportunity to introduce the concept of “reasonable ranges” and help students develop a sense of acceptable margins of error.