

Get It Guide Tutorials use effective questions to help students focus and elaborate on their thinking process as they work through a math problem.

Encourage students to read and **think aloud** as they work through a tutorial.

Hmmm... They're writing a new fraction... so that both fractions have the same denominator

Can you describe what the student is doing at this step of their solution?

How would you perform this step?

What previous math skills do you use as you perform this step?

$$-8\frac{3}{4} - \left(-2\frac{1}{2}\right)$$

$$-\frac{35}{4} - \left(-\frac{5}{2}\right)$$

$$\frac{35}{4} - \frac{10}{4}$$

How do you define equivalent fractions?

Can you show how these fractions are equivalent?

$$-\frac{5}{2} = -\frac{10}{4}$$

Improving the level of engaged/critical thinking a student does as they work through their solution to a problem will improve comprehension and recall.

Remind students to take some **wait-time** (3-4 seconds) to think about their response to a question.

I recall using fraction strips to show equivalent fractions

Effective questioning will also assist students in identifying any challenges and misconceptions they may have related to solving their math problem.

Reassure students not to worry about making errors. We learn from making errors!

That's my error... I'm subtracting a negative value. Instead of subtracting -10 , I'll add $+10$

To subtract two integers... we add the opposite?

Can you explain what add the opposite refers to?

Can you write other examples to demonstrate adding the opposite?

$$\frac{-35 - (-10)}{4}$$

When we ask a question we are also eliciting a response.
Students can compare their response to the tutorial.

Remind students that there is more than one way to explain and demonstrate a particular step within a solution path.

The student is writing equivalent fractions by adjusting the numerator

$$-8\frac{3}{4} - \left(-2\frac{1}{2}\right)$$

$$-\frac{35}{4} - \left(-\frac{5}{4}\right)$$

$$-\frac{35}{4} - \left(\frac{10}{4}\right)$$

Whatever I did to the bottom... I also do to the top!

$$\begin{array}{r} \times 2 \\ -\frac{5}{2} = -\frac{10}{4} \\ \times 2 \end{array}$$

A student's response to a question provides them with important information that describes where they are in the learning process.

Encourage students to **articulate** their understanding at each step of the solution path.

Emphasize the importance of also identifying and **articulating** which steps of their solution path they do not feel confident performing.

Equivalent fractions name the same amount

I can model both fractions and compare the shaded parts

Five-halves... 5 equal parts of size one-half

Ten-fourths... 10 equal parts of size one-fourth

I'll ignore the negative sign for a moment. Instead, I'll focus on the size of the parts and the shaded parts that make up each fraction model

The shaded parts of both models are equal... meaning the fractions $-\frac{5}{2}$ and $-\frac{10}{4}$ are equivalent

Students can turn any steps in their solution path requiring further help and support into learning-oriented goals.

Have students record each learning goal in preparation for next math class.

Encourage students to take responsibility for their learning and to approach you for help in math class.

This integer stays the same

Subtraction becomes addition

Write the opposite integer

$$-35 - (-10)$$

To subtract negative ten...

$$-35 + (+10)$$

I add positive ten

$$6 - (-4)$$

To subtract negative four...

$$6 + (+4)$$

I add positive four

$$(-3) - (+12)$$

To subtract positive twelve...

$$(-3) + (-12)$$

I add negative twelve

Other Examples

Prompt students to **reflect** on their thinking process by comparing the route by which they solved their math problem to that of the tutorial. Remind them that they will be encouraged to share their thinking next day in class.

Students can use the following questions as way of reflecting on their thinking process and approaches for solving:

☑ *How did I explain/perform this step within the solution path?*

☑ *Is my explanation/demonstration the same as the tutorial?*

☑ *How is my explanation/demonstration different to the tutorial?*

☑ *Can I think of other approaches for explaining/performing this step within the solution path?*

☑ *Which approach for explaining/performing this step do I prefer? Why?*

