



Reading in Mathematics

Having the confidence to *do math* means students must develop their ability to analyse, interpret and summarize information. In math, this information is a combination of words, numbers and symbols. Students make sense of this information by making connections to what they already know and what they have previously experienced.

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

Algebra - Combining Like Terms

SELECT YOUR TOPIC

Let's change our expression by rewriting some of the addition operations as subtraction. How might this adjustment influence identifying the like terms?

$$12n - 7 - 5n + 4$$

← →

When we ask a question we are also eliciting a response. Ranging somewhere between *I get it* to *I don't get it*, a student's response provides important self-assessment information. *What do I already know that will help me solve? What are the steps in my solution path I understand and feel confident performing? Which solution steps should I ask my teacher for help with?*

Responding to a question requires students listen to their inner voice as they attempt to make sense of the information they are reading. Listening to their inner voice will help students activate prior knowledge and **connect** the text to previous experiences. As students think about their response to a question they can practice and develop their ability to **infer** and **predict** mathematical outcomes.

An **expression** has terms like an equation... but no equal sign

How do I identify which terms are **Like Terms**? I see two terms with the variable n and two terms without a variable.

Let's change our expression by rewriting some of the addition operations as subtraction. How might this adjustment influence identifying the like terms?

$$12n - 7 - 5n + 4$$

Math **Operations**... add, subtract, multiply and divide

Could I think of this subtraction operation as a negative sign?

- Prompt students to take an appropriate amount of wait-time in responding to a question.
- Encourage students to...
 - Avoid saying, "I don't get it" as an automatic response
 - Read and re-read a tutorial question to determine the information relevant to their existing knowledge
 - Paraphrase the tutorial question
 - Turn their inner voice into thinking-aloud
 - Articulate their response to the question
 - Be precise as they explain calculations and strategies for solving
 - Not worry about making an error

Think-aloud strategies help students reflect and shape their understanding of a math problem. When teachers model think aloud strategies during classroom instruction they make their thinking transparent for students.

The Get It Guide™ Math Tutorials use callouts to model the thinking process of a teacher or fellow student working through their solution path. Students can gain further practice analysing, interpreting and summarizing the text presented in each callout think aloud. They can also use the callout think aloud responses to **compare**, **justify** and **reflect** on their approach for solving.

The image shows a screenshot of a math tutorial interface. The main window is titled "Algebra - Combining Like Terms" and contains the text: "Let's change our expression by rewriting some of the addition operations as subtraction. How might this adjustment influence identifying the like terms?". Below this text is the algebraic expression $12n - 7 - 5n + 4$. A smaller, overlapping window also titled "Algebra - Combining Like Terms" shows the same expression with several callout boxes. One callout says "I see two terms that have the variable n ...". Two other callouts point to the $12n$ and $-5n$ terms, stating: "This term has the coefficient 12 and the variable n ." and "The minus or subtraction operation tells me that this term can be read with a negative coefficient. This term has the coefficient -5 and the variable n ." Below the main window, there are two large callout boxes. The first says "Okay... so subtracting $5n$ is the same as having a negative term...". The second says "I'll read each term before simplifying to avoid a calculation error... Positive $12n$... Negative 7 ... Negative $5n$... Positive 4 ".

Algebra - Combining Like Terms

Let's change our expression by rewriting some of the addition operations as subtraction. How might this adjustment influence identifying the like terms?

$$12n - 7 - 5n + 4$$

Algebra - Combining Like Terms

I see two terms that have the variable n ...

$$12n - 7 - 5n + 4$$

This term has the coefficient 12 and the variable n .

The minus or subtraction operation tells me that this term can be read with a negative coefficient. This term has the coefficient -5 and the variable n .

Okay... so subtracting $5n$ is the same as having a negative term...

I'll read each term before simplifying to avoid a calculation error...
Positive $12n$... Negative 7 ...
Negative $5n$... Positive 4

Algebra - Combining Like Terms

SELECT YOUR TOPIC

In what ways are your solutions for simplifying each expression different?

$$12n + 7 + 5n + 4$$

$$12n - 7 - 5n + 4$$



SELECT YOUR TOPIC

Algebra - Combining Like Terms

In the second expression, I needed to recall how I add negative and positive values... integers

$$12n - 5n - 7 + 4$$

How is $12 - 5$ the same as $12 + (-5)$?

I must be careful to identify the negative term in my calculation $(-7) + 4$



I think I prefer to simplify by adding negative values rather than subtraction.

