



# Argue in Science, Grades 4-5: Introduction

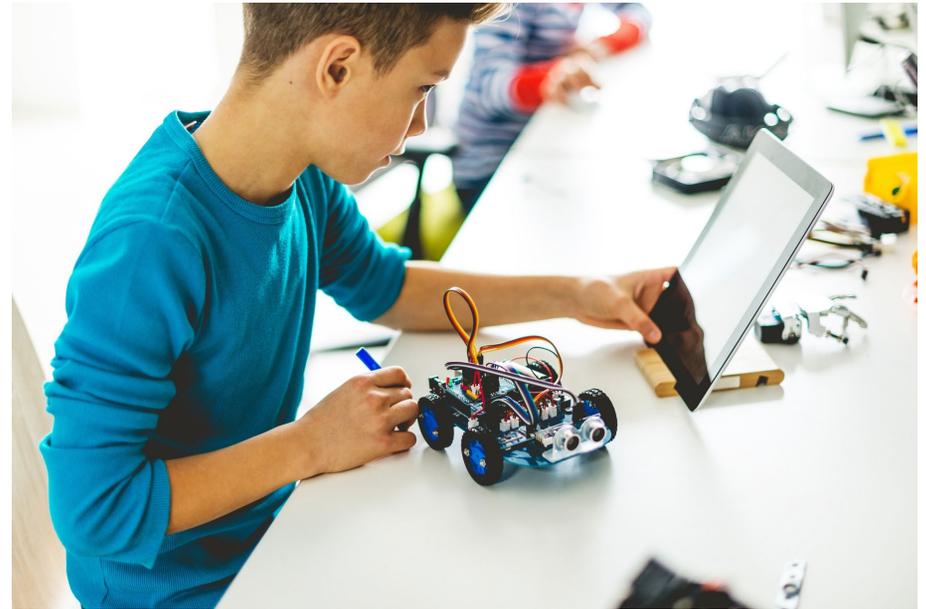
## Significance of Key Language Use

*Argue* is increasingly becoming part of the science curriculum, and by extension, directly impacts multilingual learners. In upper elementary school, scientific argumentation is surrounded by language with students processing, sharing, co-constructing, and challenging ideas. Students come to realize that the kind of discourse that generates scientific talk around argument begins with questions that do not necessarily have an established answer, but that they can be part of a scientific community evaluating potential conclusions.

## Contributions of Multilingual Learners

As students enter this developmental phase, language and content expectations intermingle as students engage in argumentation in science and STEM. During these years, multilingual learners begin to challenge scientific explanations and cite evidence in their home language or in English. In addition, students identify and use evidence from visual, digital, and text sources to critique scientific solutions posed by their peers.

Multilingual learners' linguistic and cultural experiences must be met with instructional congruence (Lee & Fraud, 2001), where educators match students' assets with disciplinary practices to make science accessible, meaningful, and relevant. In that way, students are able to collaborate with peers knowing that their ideas, languages, and cultures are valued. In addition, to better promote classroom equity, scientific content language must be made explicit while inviting students to share their own awareness or questions about the content.



## All educators are encouraged to work collaboratively to engage multilingual learners by

- Asking multilingual learners to apply their culturally informed reasoning to their scientific exploration
- Facilitating peer-to-peer interaction to formulate explanations for scientific phenomena
- Having students apply real-life experiences, observations, and perspectives to shape argument
- Modeling for students how to use data, models, and evidence in constructing or co-constructing arguments
- Making connections among home, community, and school resources to gather evidence for claims



# Argue in Science, Grades 4-5: Connecting Content and Language

**Definition of Argue in Science:** the critique of scientific explanations or solutions by citing relevant evidence about the natural and designed worlds

Common Concepts and Disciplinary Practices Derived from Academic Achievement Standards	Associated Language Features
<ul style="list-style-type: none"> <li>• Evaluation of methods and tools for collecting data to use as evidence</li> <li>• Critique of proposed procedures, explanations, or models by citing relevant evidence and posing specific questions</li> <li>• Use of data to evaluate claims about cause and effect</li> <li>• Determination of the merit of a solution to a problem by making a claim and citing relevant evidence about how it meets the criteria and constraints of the problem</li> </ul>	<p><b>Organizing the Argument</b></p> <ul style="list-style-type: none"> <li>• Statements of position/point of view or claims</li> <li>• Language choices based on purpose (persuasive, logical, emotive, interpretive)</li> <li>• Cohesion in connecting claims to evidence or evaluating evidence</li> <li>• Restatement of position/point of view or claims, summary of points, or conclusion</li> </ul> <p><b>Strengthening the Argument</b></p> <ul style="list-style-type: none"> <li>• Details related to type, quantity, qualities in noun groups (<i>toxic conditions, accurate measurements</i>)</li> <li>• Complex sentences to combine and link claims and evidence (<i>when, until, because, based on the evidence, therefore, according to...</i>)</li> <li>• Qualifiers and modals (<i>could, must, should, might</i>) to convey level of certainty</li> <li>• Passive voice, technical word choices, and abstract nouns representing information/ideas to formalize argument</li> </ul>

**WIDA ELD Standard 4 – Language of Science.** English language learners communicate information, ideas and concepts necessary for academic success in the content area of science.

## WIDA LANGUAGE EXPECTATIONS

Multilingual learners use language to...

### RECEPTIVE (Listening and Reading/Viewing)

**ELD.Sci.4-5.Arg.Rec:** Interpret arguments based on the clarity of claims and evidence.

### PRODUCTIVE (Speaking and Writing)

**ELD.Sci.4-5.Arg.Prod:** Construct cohesive arguments with strong claims and detailed descriptions of evidence.



# Argue in Science, **Grades 4-5:** Language Expectations and Language Functions

WIDA Language Expectations	Language Functions What students do with language to work toward meeting the WIDA Language Expectations
<p><b>RECEPTIVE (Listening and Reading/Viewing)</b></p> <p>ELD.Sci.4-5.Arg.Rec: Interpret arguments based on the clarity of claims and evidence.</p>	<ul style="list-style-type: none"> <li>• Comprehend information presented in a diagram or data display that supports a scientific argument</li> <li>• Comprehend a scientific argument expressed through a combination of words and diagrams or graphical displays</li> <li>• Follow the line of reasoning in oral arguments</li> <li>• Identify claims and evidence in a scientific argument</li> <li>• Select relevant information in a text (oral or written), model, or data set to support a scientific argument</li> <li>• Identify key information and related details (e.g., evidence and claims) in a scientific argument</li> <li>• Compare the evidence used in two arguments on the same topic</li> <li>• Compare data sets to identify similarities and differences in scientific arguments</li> </ul>
<p><b>PRODUCTIVE (Speaking and Writing)</b></p> <p>ELD.Sci.4-5.Arg.Prod: Construct cohesive arguments with strong claims and detailed descriptions of evidence.</p>	<ul style="list-style-type: none"> <li>• Analyze different arguments on the same topic</li> <li>• Construct an argument with evidence to support a claim</li> <li>• Describe evidence (e.g., data presented in a graph or table) in support of a claim</li> <li>• Describe relationships among claim, evidence, and reasoning in a scientific argument</li> <li>• Critique claims, evidence, and reasoning in an argument</li> <li>• Explain how information presented in a diagram or data display supports a scientific argument</li> <li>• Summarize key information (claims and supporting evidence) in a scientific argument</li> </ul>

# WIDA Proficiency Level Descriptors for Receptive Language

## Listening and Reading/Viewing, Grades 4-5

As they work towards meeting WIDA English Language Development Standards and WIDA Language Expectations,  
with instructional support, multilingual learners will process...

	End of Level 1 Entering	End of Level 2 Emerging	End of Level 3 Developing	End of Level 4 Expanding	End of Level 5 Bridging	Level 6 Reaching
<b>Discourse Dimension</b>  Amount of language  Relationships among ideas	<ul style="list-style-type: none"> <li>Discourse with a series of extended sentences</li> <li>Related ideas about concrete and new topics</li> </ul>	<ul style="list-style-type: none"> <li>Discourse with extended series containing multiple components and subcomponents</li> <li>An expanded idea about topics and their subcomponents</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse, with emerging coherence and cohesion</li> <li>Multiple, related ideas with a balance of concrete and new topics and their subcomponents</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse, organized to heighten coherence and cohesion</li> <li>Multiple, related ideas that extend concrete topics and experiences to abstract themes</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse that varies in length and order of phrases and clauses</li> <li>Multiple cohesive and organized ideas about complex topics, including varied perspectives</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse, with many embedded phrases and clauses, that varies in length and order</li> <li>Multiple cohesive and organized ideas about complex topics that tie to overarching, sometimes abstract themes, theses, claims, etc.</li> </ul>
<b>Sentence Dimension</b>  Variety of language forms and conventions  Language choices characteristic of context	<ul style="list-style-type: none"> <li>Simple and compound phrases and sentences (with variation in placement of subject, verb, adjective, adverb)</li> <li>A developing range of language patterns used in social and instructional situations or across content areas</li> </ul>	<ul style="list-style-type: none"> <li>Simple and compound sentences, using basic connectives, expanded with emerging variation</li> <li>A wide range of language choices that vary according to social setting (e.g., playground, classroom, or community)</li> </ul>	<ul style="list-style-type: none"> <li>A series of compound and some complex sentences (e.g., occasionally beginning with phrases or subordinate clauses)</li> <li>A range of language choices that vary according to social setting and purpose (e.g., persuading, entertaining)</li> </ul>	<ul style="list-style-type: none"> <li>An emerging variety of sentence lengths and parts of speech</li> <li>A range of language choices that vary according to social setting, who's involved (e.g., peer-to-peer vs. peer-to-teacher), and purpose (e.g., persuading, entertaining)</li> </ul>	<ul style="list-style-type: none"> <li>A range of sentence structures with varying complexity, some use of sophisticated connectives to link ideas, events, or reasons</li> <li>A wider range of language choices that vary according to task (e.g., facilitating a science experiment), purpose, social setting, and who's involved</li> </ul>	<ul style="list-style-type: none"> <li>A wide range of sentence structures with varying complexity, sophisticated connectives to link or combine ideas, events, or reasons</li> <li>A wider range of language choices that vary according to task (e.g., providing peer feedback on a writing assignment), purpose, social setting, and who's involved</li> </ul>
<b>Word/Phrase Dimension</b>  Range of vocabulary  Specificity of language to context	<ul style="list-style-type: none"> <li>General language; close cognates</li> <li>Everyday language expanded with added details (e.g., simple contractions, simple possessives, multiple adjectives, adverbs, and prepositional phrases)</li> </ul>	<ul style="list-style-type: none"> <li>General language; a few specific words/phrases appearing across content areas; close cognates and basic morphemes (e.g., roots, prefixes, suffixes)</li> <li>Everyday language expanded with added details (e.g., compound words, multiple adjectives, adverbs, and prepositional phrases)</li> </ul>	<ul style="list-style-type: none"> <li>Some specific language; a range of morphemes (e.g., roots, prefixes, suffixes)</li> <li>Language using more precise or subtle ways to say relatively simple things including idioms and common collocations (e.g., words/phrases that co-occur)</li> </ul>	<ul style="list-style-type: none"> <li>Most specific language; some technical words/phrases; a wider range of morphemes</li> <li>Language using more precise or subtle ways to say relatively simple things including connotative meanings (e.g., words with cultural or emotional associations)</li> </ul>	<ul style="list-style-type: none"> <li>Most specific language and many technical words/phrases</li> <li>Precisely selected language essential to understanding new concepts, clarifying contextual details with multiple meanings (e.g., nuance, connotations, shades of meaning)</li> </ul>	<ul style="list-style-type: none"> <li>Many technical words/phrases</li> <li>Precisely selected language essential to understanding new concepts, using multiple meanings and descriptive, poetic, and figurative language and to clarify contextual details</li> </ul>

# WIDA Proficiency Level Descriptors for Productive Language

## Speaking and Writing, Grades 4-5

As they work towards meeting WIDA English Language Development Standards and WIDA Language Expectations,  
with instructional support, multilingual learners will produce...

	End of Level 1 Entering	End of Level 2 Emerging	End of Level 3 Developing	End of Level 4 Expanding	End of Level 5 Bridging	Level 6 Reaching
<b>Discourse Dimension</b>  Amount of language  Degree of adjustment by genre/topic/task, audience, and format	<ul style="list-style-type: none"> <li>Discourse lengthened with prepositional phrases; emerging connection of ideas</li> <li>Language choices that convey evidence of adjustment for topic and genre</li> </ul>	<ul style="list-style-type: none"> <li>Extended discourse that expands related ideas on the same topic</li> <li>Language choices that convey evidence of adjustment for topic and genre</li> </ul>	<ul style="list-style-type: none"> <li>Extended discourse with multiple, related ideas on the same topic</li> <li>Language choices that convey evidence of adjustment for topic and genre</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse that varies in length and order of phrases and clauses</li> <li>Language choices that convey evidence of adjustment for topic, genre, and audience</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse that vary in length and order of phrases and clauses to expand ideas or relate multiple ideas through emerging coherence, detail, and clarity</li> <li>Language choices that convey evidence of adjustment for topic, genre, and audience</li> </ul>	<ul style="list-style-type: none"> <li>Connected discourse, with many embedded phrases and clauses, that vary in length and order to expand ideas or relate multiple ideas through emerging coherence, detail, and clarity</li> <li>Language choices that convey evidence of adjustment for topic, genre, and audience</li> </ul>
<b>Sentence Dimension</b>  Variety of language forms and conventions in expression  Fluency of sustained, focused expression	<ul style="list-style-type: none"> <li>Simple sentences with some embedded phrases and dependent clauses</li> <li>Variable control of effective language choices, including connectives and cohesive devices, with some language repeated from models</li> </ul>	<ul style="list-style-type: none"> <li>Simple and compound phrases and sentences (with variation in placement of subject, verb, adjective, adverb)</li> <li>Developing control in making effective language choices, including connectors and cohesive devices, using original language beyond models</li> </ul>	<ul style="list-style-type: none"> <li>Simple and compound sentences expanded with emerging variation</li> <li>Developing control in making effective language choices, including connectors and cohesive devices, using original language beyond models</li> </ul>	<ul style="list-style-type: none"> <li>A series of compound and some complex sentences (e.g., occasionally beginning with phrases or subordinate clauses)</li> <li>Effective, controlled language choices, including connectors and cohesive devices</li> </ul>	<ul style="list-style-type: none"> <li>A series of compound and complex sentences (e.g., using basic and sophisticated connectives)</li> <li>Effective, controlled language choices, including connectors and cohesive devices</li> </ul>	<ul style="list-style-type: none"> <li>An emerging variety in sentence lengths and parts of speech</li> <li>Effective, controlled language choices, including connectors and cohesive devices</li> </ul>
<b>Word/Phrase Dimension</b>  Range of vocabulary common to age group  Specificity of language to context	<ul style="list-style-type: none"> <li>General, high frequency oral vocabulary with some irregular words (easy to understand in context); close cognates</li> <li>Language expanded with added details (e.g., simple contractions, simple possessives, multiple adjectives, adverbs, and prepositional phrases)</li> </ul>	<ul style="list-style-type: none"> <li>General language; close cognates</li> <li>Language expanded with added details (e.g., multiple adjectives, adverbs, and prepositional phrases)</li> </ul>	<ul style="list-style-type: none"> <li>General language; a few specific words/phrases (i.e., appearing across content areas); close cognates and basic morphemes (e.g., roots, prefixes, suffixes)</li> <li>Language expanded with added details (e.g., longer noun groups and verb groups)</li> </ul>	<ul style="list-style-type: none"> <li>Some specific language; a range of morphemes (e.g., roots, prefixes, suffixes)</li> <li>Language using more precise or subtle ways to say relatively simple things including idioms and common collocations (e.g., words/phrases that co-occur)</li> </ul>	<ul style="list-style-type: none"> <li>Most specific language; some technical words/phrases; a wider range of morphemes</li> <li>Language using more precise or subtle ways to say relatively simple things including connotative meanings (e.g., words with cultural or emotional associations)</li> </ul>	<ul style="list-style-type: none"> <li>Many technical words/phrases</li> <li>Precisely selected language essential to understanding new concepts, using multiple meanings (e.g., nuance, connotations, shades of meaning) to clarify contextual details</li> </ul>