LANGUAGE & CULTURE
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Multilingual Learners as Scientists

The synergy of NGSS and WIDA

CESA2

Multilingual Learners as Scientists: The Synergy of NGSS and WIDA

When we think of science, some people imagine a white-coated lecturer, or a silent lab technician. But look

The Red Balloon

within the disciplines, such as science, by adding the Key Language Uses (see chart on page 2) to each content

the end, but a means to an end.

***Multimodality**, the use of multiple means of communication, is an essential way for all students to access and engage in the content areas. In addition to the use of spoken and written language, students also communicate through gestures, facial expressions, images, equations, maps, symbols, diagrams, charts, videos, graphs, computer-mediated content, and other means.*

-WIDA Standards 2020, p. 19

Key Language Uses from the WIDA 2020 Standards
(WIDA standards, 2020, p. 26-27)

Key Language Use	[illegible]
NARRATE	[illegible]
INFORM	[illegible] concepts, ideas, or phenomena.
EXPLAIN	[illegible] made, and social phenomena.
ARGUE	[illegible]

Key Language Use Example #1: Explain

Kindergarten focus on speaking/listening using voice recording technology to conduct an investgaton about forces.

The Kindergarteners in Moreno’s class are learning [illegible] the classroom door to the hallway. The robot goes [illegible] when it hits a barrier. The kindergartners need to [illegible]

[illegible] concepts and the language needed to communicate [illegible]

of the main highway, and labels. Also, the [illegible]

[illegible] need them. This approach does not simplify [illegible] response to student talk), the teacher asks [illegible]

[illegible]

toward the books shelf, then he will stop when he
because there is nothing else between me and the

teacher, they keep track of their progress using
teacher plans to support the students, listening
2 below.

Key Language Use Example #2: Inform

Fourth grade focuses on reading and writng using email to analyze data about shadows at diferent places on the planet.

Ln the fourth gradeΣ students are testing out shadows in two diferent parts of the worldΣ emailing a άpenπpalέ πth grade class in Argentna They want to test the length and directon of the shadows at noonΣ and use evidence to engage in scientŬc argument with one another about the reason for the early (or late) sunrise and sundown.

and goes down. They use email to check if the
South America. Each class keeps track of the data collected on a line graph.

The teacher supports newcomers by helping them insert a picture of classmates' shadows at 9am, 12pm, and 3pm, and adding labels to send the

in an email. One student, who speaks Wolof as

Key Language Use Example #3: Narrate and Explain

Eighth graders focus on images and spoken words in photographs to model transfer of energy at the particle level.

Eighth graders in Veguilla's dual language classroom are going to narrate a story about the energy that they used during the day, using images taken from their phone. Each student will put together a day (could be at school), and how energy was transferred to accomplish tasks.

Veguilla's goal for students is to bring in details to tell a story about how the energy was transferred,

NGSS and WIDA Standards Referenced in the Kindergarten Lesson

NGSS Standard	WIDA Standards
K-PS 2-1 [illegible]	**ELD-SC.K.Explain.Expressive** [illegible] • [illegible] • [illegible] • [illegible] **ELD-SC.K.Explain.Interpretive** [illegible] • [illegible] [illegible] • [illegible] [illegible]

NGSS and WIDA Standards Referenced in the Fourth Grade Lesson

NGSS Standard	WIDA Standards
5-ESS1-2 Represent data in graphical displays [illegible] day and night, and the seasonal appearance of some stars in the night sky.	**ELD-SI.4-12.Inform** • [illegible] [illegible] • [illegible] [illegible] • Describe the parts and wholes of a system • [illegible] • [illegible]

phenomena to model during the course of the week. This day, to engage in the phenomenon,

related language as needed.

The teacher is ready to support ideas, rather

on the board. She asks students to point out what they heard, smelled, felt, and saw during the

I was transferring stored energy to energy of

toast popped up in the morning, transferring spring

The teacher accepted the not-quite-perfect use

being transferred. The rest of the class suggested

Narrate

This lesson applies learning toward the

Key Language Use Example #4: Argue

Tenth graders focuses on using modeling to repres local ecosystem.

Ln tenth gradeΣ students languageproŬciency leve They are collaboratng to to mathematcally model t

carrying capacity for deer. The teacher has the

Oh Deer! for added fun

decreases due to natural pressures. The students

and numbers from the *Oh Deer!* game they played.

Oh Deer! went

teacher will support the students plugging in some

support this learning, she slows down and models

oral language before sending students into groups

how natural language, symbolic language, and graphing work together because she is aware that it

NGSS and WIDA Standards Referenced in the Eighth Grade Lesson

NGSS Standard	WIDA Standards
MS-PS3-2 [illegible] [illegible] [illegible] are stored in the system. **MS-PS1-4** [illegible] [illegible] state of a pure substance when thermal energy [illegible] [illegible] [illegible] **PS3.C: Relationship Between Energy and Forces** [illegible] force on the other that can cause energy to be [illegible]	**ELD-SI.4-12.Narrate** • [illegible] [illegible] • [illegible] • [illegible] [illegible] • [illegible] • [illegible] **ELD-SC.6-8.Explain.Expressive** [illegible] • [illegible] phenomenon • [illegible] communicated • [illegible] [illegible] • [illegible] [illegible]

NGSS and WIDA Standards Referenced in the Tenth Grade Lesson

NGSS Standard	WIDA Standards
HS-LS2-1 [illegible] [illegible] [illegible] [illegible] With the application of the Crosscutng concepts **Stability and Change** [illegible] [illegible] [illegible]	**ELD-SI.4-12.Argue** • [illegible] • Support or challenge an opinion, premise, or • [illegible] • Clarify and elaborate ideas based on feedback • [illegible] **ELD-MA.9-12.Argue.Expressive** [illegible] • [illegible] [illegible] • [illegible] • [illegible] principles • [illegible]

CONCLUSION

[illegible]
phenomenon-based learning of science.

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[illegible] 2, Ruslana was a researcher at WIDA (2013- 2021) where she contributed to the [illegible]

[illegible] sourdough bread, kimchi, and kombucha which she makes at home. She is also an author of a memoir *From Borsch to Burgers: A Cross-cultural Memoir* where she [illegible]

Dr. Emily [illegible] for Multple L[illegible]
{he is a lead writer for the Divers[illegible]
{cience {tandardsΣ a member of the [illegible]
peerπreviewed research artcles. {h[illegible]
boo]Σ bD{{ for AllΣ and practce bo[illegible]
and h]hee Lee. .efore academiaΣ Em[illegible]
and .ilingual Resource science spec[illegible]
as an associate researcher on an b{F[illegible]
with the Wisconsin Center for Educatona[illegible]
WLDA to design Discourse Tools aligned w[illegible]
the adopton of the new ELD standards in [illegible]
eÈamining sensema]ing practces for under[illegible]
conteÈtsΣ and how teachers can build on [illegible]
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