Integrating Science And Language For All Students With A Focus On English Language Learners

Brief 4 of 7

LANGUAGE INSTRUCTIONAL SHIFTS

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Enacting instruction aligned to the New York State (NYS) P-12 Science Learning Standards with English language learners (ELLs) requires shifts in how teachers think about language in the science classroom. This brief introduces language instructional shifts, or contemporary ways of thinking about language that depart from more traditional thinking. Traditionally, science instruction with ELLs has emphasized learning discrete elements of vocabulary and grammar. In contrast, contemporary thinking emphasizes using language, in combination with other meaning-making resources, to engage in purposeful communication in the science classroom.

The three language instructional shifts presented in this brief focus on modalities, registers, and interactions. For each shift, we will address (1) what is the shift, (2) what does the shift look like in science classrooms with ELLs, and (3) what can teachers do in their own classrooms to begin enacting the shift.

Each shift is illustrated in the context of a fth-grade science unit aligned to the standards and designed with a speci c focus on ELLs. In this unit, students explain the phenomenon of garbage in their home, school, and community while developing their understanding of key physical and life science ideas. roughout this brief, we will refer to this unit as “the garbage unit.” e complete unit is available at nyusail.org for teachers to download and use.

AT A GLANCE

MODALITIES

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REGISTERS

INTERACTIONS

MODALITIES

Modalities refer to the multiple and diverse channels through which communication occurs. ese include the linguistic modalities of listening, speaking, reading, and writing as well as visual modalities, such as drawings, symbols, graphs, and tables. Engaging in science practices called for by the NYS P-12 Science Learning Standards involves using multiple modalities to communicate ideas. For example, students develop explanatory models of science phenomena using a combination of drawings, symbols, and written language.

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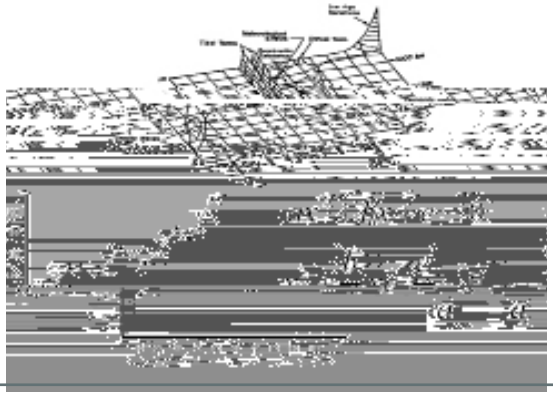
[redacted]	

What is the shift?

Traditionally, nonlinguistic modalities (e.g., visuals) have been thought of as sca olds for ELLs until these students develop English pro ciency. For example, ELLs may be asked to draw their understanding of science ideas but only until they can communicate those ideas using linguistic modalities (e.g., a written explanation). Contemporary thinking suggests that nonlinguistic modalities are essential to engaging in science practices and especially bene cial to ELLs. In other words, drawings, symbols, graphs, and tables are not just sca olds toward language; they are essential meaning-making resources of science disciplines. us, using multiple modalities to communicate ideas is important for all students in the science classroom and can be particularly bene cial to ELLs at the beginning levels of English pro ciency.

TRADITIONAL THINKING

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CONTEMPORARY THINKING

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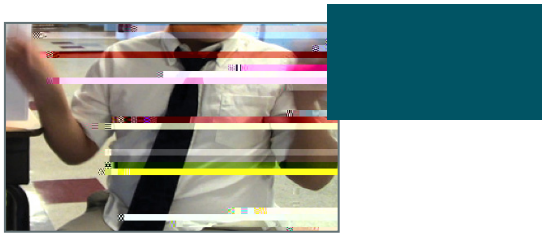
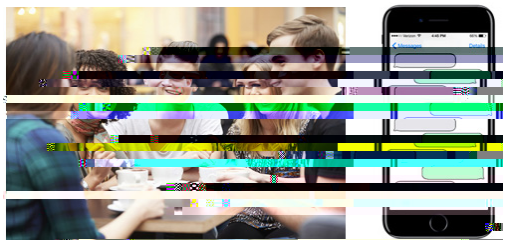
What does the shift look like in the classroom?

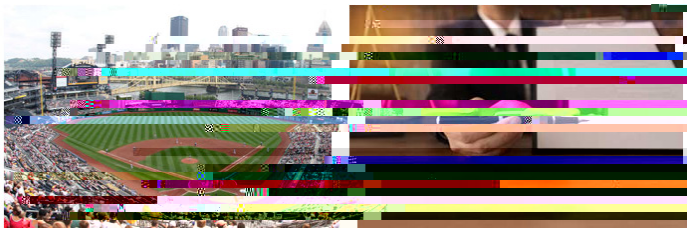
In the garbage unit, students make observations of garbage materials over time. When they start to notice unpleasant smell coming from the decomposing food materials, students wonder, “What is that smell?” a “How does it get to my nose?” As they engage in investigations to answer these questions, students use mul modalities to communicate their emerging ideas. Alicia uses a combination of drawings, symbols, and writt language to develop a model of smell made of gas particles. Isabel, a former ELL, writes a computer progr that instructs gas particles from a decomposing banana to move freely around in space. Samuel, an ELL, ing fmbina moawings,rites a computer program



REGISTERS

Registers refer to ways of using language in different contexts or for different purposes. Registers exist on a continuum from everyday to specialized. Everyday language is the language used in daily life, for example, when grabbing a cup of a coffee with a friend or writing a text message. Specialized language is the language used among members of a particular community to carry out their collective work, for example, the language used by sports announcers when calling a baseball game or by lawyers when drafting a contract. is specialized language a offers the precision necessary to communicate ideas with exactness. As students engage in science practices called for in the NYS P-12 Science Learning Standards, they use registers ranging from everyday to specialized in their science classroom communities.





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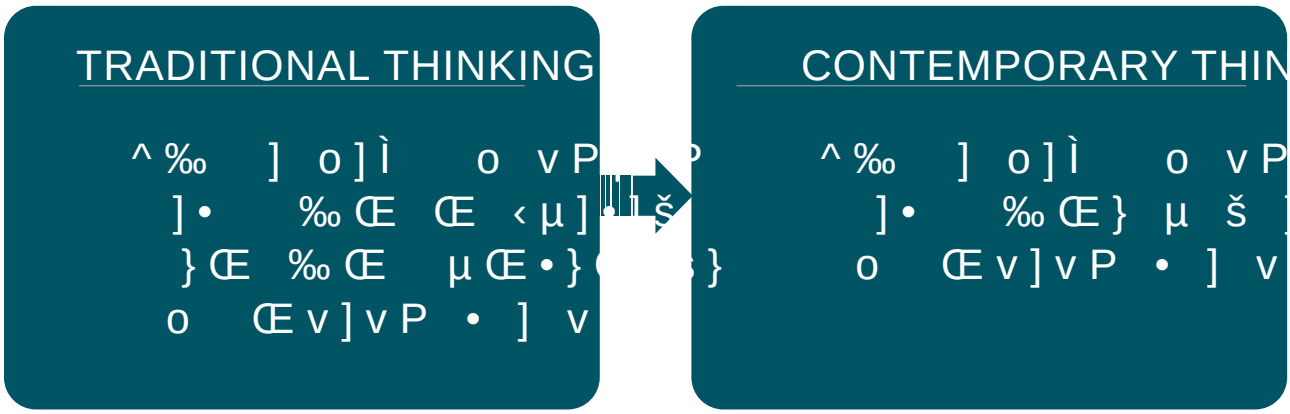
Traditionally, specialized language has been thought of as a precursor or prerequisite to learning science. For example, ELLs may be expected to master specialized science vocabulary (e.g., “particles”) at the beginning of a lesson or unit before they are deemed ready to engage in rigorous grade-level science instruction. However, this traditional thinking can exclude ELLs from the very opportunities for sense-making and interaction that they need to develop specialized language. Contemporary thinking suggests that, rather than being a precursor or prerequisite, specialized language is actually a product of learning science. In other words, as students develop more sophisticated science understanding over the course of instruction, they also develop the specialized language to communicate their ideas with precision.



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In the garbage unit, students notice an unpleasant smell coming from the decomposing food materials. As s

INTERACTIONS

Interactions refer to the setting and participants involved in communication. In science classrooms that em brace the vision of the NYS P-12 Science Learning Standards, students work together as a community tow the common goal of explaining phenomena. In this classroom community, students engage in a range of d ferent interactions. ese include one-to-one interactions (e.g., one student talking to a partner), one-to-small group interactions (e.g., one student talking to a small group), one-to-many interactions (e.g., one stude talking to the class), and small group-to-many interactions (e.g., a small group talking to the class). Each these interactions requires students to use modalities and registers di erently. For example, one-to-many int

Sara needs to be more explicit about what exactly is the same (i.e., the weight) and when (i.e., from time poi
to time point 3). Sara's language use is di erent between these two interactions but equally e ective, as it respo
to each interaction's communicative demands.